What's next for Win 2003? Windows 2003 is the linchpin for a plethora of forthcoming products. **PAGE 25.**

Review Apple's new Xserve server, based on open source OS, is fast, feature-rich and pricey. **PAGE 49.**

NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

May 12, 2003 ■ Volume 20, Number 19

Budget woes fail to deter statehouse net execs

■ BY TIM GREENE

CHARLESTON, W. VA. — Undaunted by staffing and money shortages, some state governments are forging ahead with major IT projects ranging from installation of significant fiber WANs to building vast criminal-justice databases.

Government technology officials at the National Association of State Telecommunications Directors Northeast meeting last week expressed frustration over dramatic state budget and staff cuts, but bubbled with enthusiasm about advanced projects that promise to save their states money, meet demand for network bandwidth and deliver on e-government directives.

For example, West Virginia is saving thousands of dollars with videoconferences that replace meetings that would require travel. Pennsylvania's new fiber network is boosting bandwidth and a new network services contract is saving the state $1.18 million per year. And New Jersey is boosting its backbone bandwidth from OC-3 to OC-12 to support citizens' access to online state services.

See States, page 14

Wireless LAN switch feast

Start-up execs debate future of wireless LANs at NW dinner.

Aruba's Keerti Melkote (above, left) talks with AirFlow's Robert Machlin; they were among the five wireless LAN start-up execs at our dinner (inset top row, from left, Melkote, Machlin, Trapeze's Flach; bottom row, from left, Vivato's Biba and Airespace's Galloway).

■ BY JOHN COX

The CEOs and founders of five wireless LAN switch start-ups broke bread with *Network World* editors at Rosemary's Restaurant during NetWorld+Interop, Las Vegas. The idea was that between bites of Ahi tuna and goat cheese hazelnut cheesecake we would chew on the issues of enterprise WLANs and this new class of product called wireless switches.

Not surprisingly, all of the executives — from Airespace, AirFlow Networks, Aruba Wireless Networks, Trapeze Networks and Vivato (see their biographies at www.nwfusion.com, DocFinder: 5836) — are convinced that WLANs are poised to create a huge new market, with plenty of room at the table for ambitious new entrants, namely themselves.

The Wi-Fi wireless Ethernet movement in some

See Wi-Fi, page 63

■ REVIEW G-Whiz: We review the first batch of 802.11g wireless LAN gear. Page 42.

MARK HARMEL

HP to enter crowded field with WLAN gear

■ BY PHIL HOCHMUTH

PALO ALTO — HP next week will announce products for boosting wireless LAN security and management while reducing the cost and complexity of rolling out access points, according to industry sources.

In doing so, HP will become the latest of several companies — both established vendors and newcomers — to introduce what are becoming known as WLAN switches.

According to sources briefed by HP, the company will launch its ProCurve 720 Access Controller, a centralized switch for connecting wireless access points. HP also will announce the ProCurve 740 Access Control Server, which will act as a management and configuration node for the ProCurve wireless infrastructure.

The company says it will make network-related announcements but declined to give specifics.

The 720 will connect to industry-standard 802.11b access points, such as HP's previously announced ProCurve 520wl product, and provide services such as end-user verification via the

See HP, page 10

NEWSPAPER ■ $5.00

002

EMC, HP to push metered storage

■ BY DENI CONNOR

EMC and HP are readying metered on-demand storage programs that for the first time automatically charge customers only for actual usage, which should help them save money and avoid having to predict future needs precisely.

While both vendors declined to comment, documents on EMC's Web site introduced EMC's product, called OpenScale. OpenScale meters a customer's use of storage assets and reports it automatically to EMC so billing can be generated. The service, which is in pre-release and has been available to select customers on a

See EMC, page 16

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5/12/03

NetworkWorld

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Review: Apple's new Xserver, based on an open source operating system, offers impressive performance, and some advanced features. **Page 49.**

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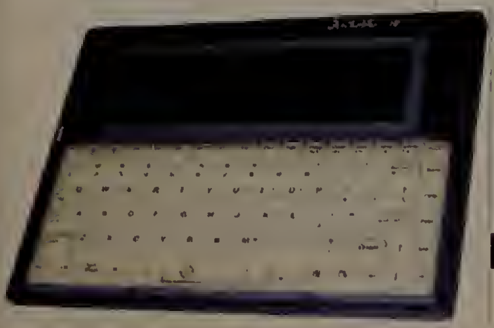

The QuickPAD Pro Mail includes a built-in word processor.

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NetworkWorldFusion

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Interactive

Personal firewalls for all

In our forums, a user asks: "I am starting to roll out a global Internet access dialer, and was asked about the need for a personal firewall on all PCs that will be getting this software."

DocFinder: 5833

Cabling advice

A user has run out of wall ports in one office and wants to know if he should get a cabling company in or if a new switch would be a better choice.

DocFinder: 5834

Speeding up or slowing down the 'Net?

Start-up Netli says it can speed 'Net traffic with a proprietary TCP replacement. One network pro says it could actually slow traffic. Read his thoughts and Netli's reply.

DocFinder: 5655

Audio primer: Digital rights management

Find out what 10 things you need to know before implementing digital rights management in your company.

DocFinder: 4741

■ **CONTACT US** Network World, 118 Turnpike Road, Southborough, MA 01772; **Phone:** (508) 460-3333; **Fax:** (508) 490-6438; **E-mail:** nwnews@nww.com; **STAFF:** See the masthead on page 20 for more contact information. **REPRINTS:** (717) 399-1900

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Columnists

Compendium

How many AOL programmers does it take to screw in a lightbulb?

Fusion Executive Editor Adam Gaffin has no idea, but he does know someone who claims it takes 400 AOL programmers to write the company's impending Weblog software.

DocFinder: 5841

Telework Beat

Efficient Networks rethinks retail

Net.Worker Managing Editor Toni Kistner says the vendor has discovered that selling home network gear to consumers is tougher than it looks. **DocFinder: 5842**

Small Business Tech

The next big thing in backup

Columnist James Gaskin says DVD backup and archive systems will be widespread before long.

DocFinder: 5843

Digital Domicile

The hidden value of home networks

Columnist Mike Wolf offers insight on why Intel and Microsoft are investing in such a puny market. **DocFinder: 5844**

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We've made it easy to access articles and resources online. Simply enter the four-digit DocFinder number in the search box on the home page, and you'll jump directly to the requested information.

NewsBits

3Com moves east

■ 3Com's top executives are moving from Silicon Valley to Massachusetts, the company announced last week. CEO Bruce Claflin and several top executives will relocate to the company's Marlborough, Mass., facility, where its enterprise network operations are based. The move is aimed at consolidating the company's management team around its core business, 3Com said. Making the trek from 3Com's Santa Clara offices are Claflin, CFO Mark Slaven, Executive Vice President of Operations Dennis Connors and a yet-to-be-named executive vice president of sales. Executives in charge of 3Com's business development, corporate services and legal operations will stay in Santa Clara.

Cisco warns of VPN vulnerabilities

■ Cisco last week warned customers of vulnerabilities in its VPN 3000 Series concentrators and VPN 3002 Hardware Client that could let attackers see private data or carry out a denial-of-service attack. There are workarounds to mitigate the effects of these vulnerabilities, and users can protect against them by upgrading to the latest version of code for the devices, according to a Cisco advisory. The Cisco 3005, 3015, 3030, 3060 and 3080 VPN Concentrators and the Cisco VPN 3002 Hardware Client all might be affected by the vulnerabilities. An advisory about the problems can be read at www.nwfusion.com, DocFinder: 5849.

EarthLink wins case against spammer

■ A district court in Atlanta last week awarded EarthLink $16 million in damages against a New York man who allegedly sent more than 825 million spam messages through the ISP's network. The court also banned the defendant from spamming and from a host of other activities related to it, such as distributing mass e-mail software and selling e-mail addresses, according to Pete Wellborn, legal counsel for EarthLink. The ISP said that a ring, led by Buffalo resident Howard Carmack, obtained Internet accounts using stolen credit cards, identity theft and bank fraud, and then used those accounts to send out reams of spam. "The court's permanent injunction protects Internet users everywhere and the $16 million damages award sends a message to everyone out there that if you keep spamming, there will be a financial death penalty," Wellborn said. Carmack could not be reached for comment.

DDoS attack on SCO linked to suit?

■ The SCO Group last week said it suffered a massive distributed denial-of-service attack that consumed about 90% of the available bandwidth of SCO's service provider for the Lindon, Utah, backbone network. SCO said the FBI and the U.S. Attorney's Office are investigating. There is suspicion that the attack might have been in response to SCO's Linux-related lawsuit against IBM alleging intellectual property infringement because it came within 48 hours of IBM's response to that suit. "Given this close proximity in time, we are carefully examining whether a link exists between SCO's legal action and some of the Linux community who are hostile toward SCO for asserting its legal rights," a SCO spokesperson said.

COMPENDIUM

Software audits are fun!

The Business Software Alliance has a new online game for kids, in which the object is to throw balls at evil ferrets to make them drop their stolen software – which you then have to catch before it hits the ground.

Catch more at www.nwfusion.com, DocFinder: 5835.

■ TheGoodTheBadTheUgly

Keeping speech free. The California legislature is considering a proposed law that would require that anonymous posters to online forums be given notice and a chance to object before ISPs can reveal their identity to corporations that claim defamation or other legal harm. The American Civil Liberties Union and online privacy organizations are backing the bill.

The plane truth. Airlines should continue their ban on the use of mobile phones on board aircraft because of possible interference with navigation and communication equipment, according to a study by the U.K. Civil Aviation Authority. The study could deal a blow to some airlines, such as Scandinavian Airlines System, which hope someday to offer passengers the opportunity to use their mobile phones in the air in much the same way they're accustomed to on the ground.

You almost done surfing in there? Microsoft's MSN UK business is testing an Internet-enabled outhouse, dubbed the iLoo, that it plans to make available at outdoor festivals this summer. The portable toilet unit will include a flat-screen plasma display and wireless keyboard. The kicker is that MSN UK is working with toilet-paper makers on rolls that feature Web addresses on them. ➤

FTC slaps 'do-not-call' profiteers

■ The Federal Trade Commission has asked a federal judge to stop two Web sites from making deceptive claims that they can register people for the national do-not-call list that is set to debut July. The sites — Free-Do-Not-Call-List.org and National-Do-Not-Call-List.us — had attempted to turn a buck off the wildly popular antitelemarketing measure. "These scam artists are seizing on the public's interest in the do-not-call registry," Howard Beales, director of the FTC's Bureau of Consumer Protection, told the Associated Press. "The law doesn't allow third-party profiteers to be in the do-not-call business."

'Fluffi Bunni' leader facing charges

■ A man reputed to be the leader of an international hacking ring worked in the U.K. offices of Siemens Communications, according to the company. U.K. Metropolitan Police arrested Lynn Htun on April 29 when they recognized him on a stand at the InfoSec computer security show in London after he failed to appear in court on forgery charges. Siemens said that although Htun was arrested on a charge unrelated to computer hacking, the U.K. authorities told the company they are conducting "further investigations into the activities of Mr. Htun." The Fluffi Bunni hacking group is credited with a series of attacks against the Web sites of U.S. computer security organizations between 2000 and 2002. Those organizations included www.attrition.org and the Web site for the SANS Institute.

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HP

continued from page 1

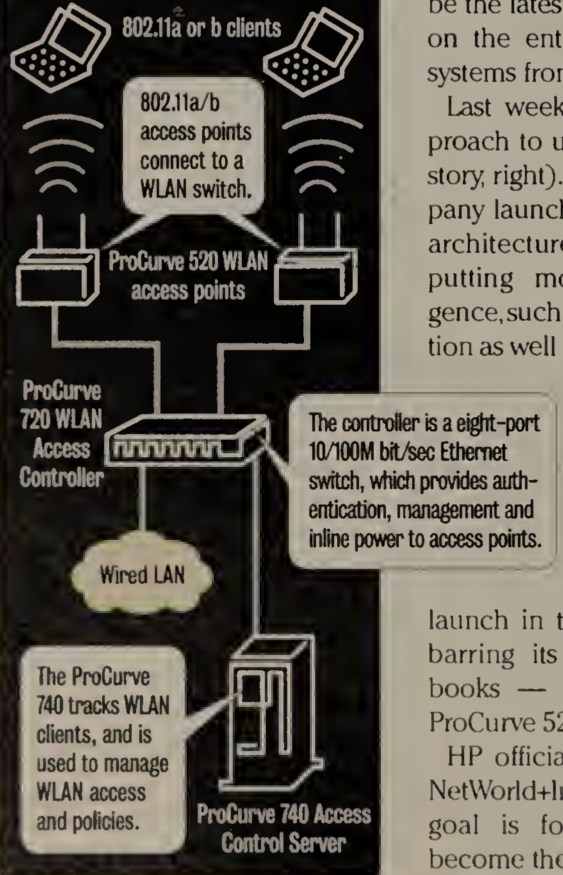
IEEE 802.1X protocol, as well as encryption and quality of service (QoS) for WLAN traffic. The box will have eight 10/100M bit/sec Ethernet ports for connecting access points. Sources say the 720 also can be configured to control wireless access points connected to regular LAN points and not directly to the box.

The 720 will compete with products from WLAN switch start-ups such Aruba Wireless Networks and Trapeze Networks and established companies such as Extreme Networks and Proxim.

The ProCurve 740 Access Control Server is a complementary appliance that will act as an authentication and management platform. Software on the server will track which clients are authorized to be attached to wireless access points. The software will let network administrators set polices for access, such as limiting what times certain access points can be active and what kinds of activities clients can do on the network — such as Web surfing or accessing network resources. Policies set on the 740 will be synchronized with the 720, which will enforce them.

HP's WLAN plan

New ProCurve access points, switches and a management server are designed to simplify WLAN deployment and security.


802.11a or b clients
802.11a/b access points connect to a WLAN switch.
ProCurve 520 WLAN access points
ProCurve 720 WLAN Access Controller
The controller is a eight-port 10/100M bit/sec Ethernet switch, which provides authentication, management and inline power to access points.
Wired LAN
The ProCurve 740 tracks WLAN clients, and is used to manage WLAN access and policies.
ProCurve 740 Access Control Server

Pricing is not known, but observers say HP likely will be aggressive based on its other switching products.

The move toward putting WLAN intelligence in enterprise wiring closets could be useful for companies installing large 802.11 networks, analysts say.

"The basic notion with this kind of architecture is you can centrally manage your wireless LAN the same way you would manage your wired LAN," says Abner Germanow, an analyst with IDC.

In a large WLAN, where access points are not centrally connected by wireless switches, network administrators make configuration or policy changes individually on dozens of access points. Wireless switches let policies be set centrally and then applied to all clients coming into the network from wireless access points.

"This seems to be the course the industry is taking," says Joshua Johnson, an analyst with Synergy Research. He says he expects to see more wired and wireless Ethernet offerings soon.

The WLAN announcements will be the latest in a flurry of activity on the enterprise network and systems front by HP.

Last week, HP clarified its approach to utility computing (see story, right). In January, the company launched its Adaptive Edge architecture, which promotes putting more network intelligence, such as 802.1X authentication as well as Layer 2 and Layer 3 QoS and security services, in enterprise wiring closets instead of the network core. The Adaptive Edge debut also was HP's launch in the WLAN market — barring its Wi-Fi-enabled notebooks — as it introduced its ProCurve 520wl access points.

HP officials said at the recent NetWorld+Interop show that their goal is for the company to become the No. 2 player in enterprise networking behind Cisco by early next year. The company is ranked third or fourth, according to different research firms.

HP's wiring closet switches sell for about half of Cisco's and Nortel's prices and cost slightly less than what 3Com charges. HP increased its LAN switch port shipments by 38% and 52% in 2001 and 2002, according to Synergy, although the company still owns just 4.6% of the Layer 2 fixed-port switch market. ■

HP to become more Adaptive

■ **BY JENNIFER MEARS AND DENISE DUBIE**

HP marked the one-year anniversary of its merger with Compaq by outlining a plan for delivering on-demand computing resources that shrink and grow according to business demands.

The strategy, dubbed Adaptive Enterprise, incorporates HP's hardware, software and services, and integrates them to help customers quickly respond to changing resource needs and thus help their organizations run more efficiently. With the announcement, HP meets Computer Associates, IBM, Microsoft and Sun, which recently have laid out plans for so-called utility computing.

Not that HP is late to the utility computing game. In fact, Adaptive Enterprise builds on products Compaq and HP had in place long before their merger last year: Compaq's Adaptive Infrastructure and HP's Utility Data Center.

What Adaptive Enterprise does is expand HP's focus from simply looking at the IT department to creating efficiencies across an entire business, analysts say (see graphic). Adaptive Enterprise uses a framework for building an IT environment that revolves around business processes. The idea behind Adaptive Enterprise is that IT infrastructure should be broken down into standard components that can be modified on the fly without negatively affecting other system components.

Global transportation company APL has outsourced its messaging infrastructure to HP for about a year, letting it focus on its core business while knowing that its e-mail systems — and the more than 600 ProLiant servers that run them — are in good hands.

It's a typical outsourcing arrangement, but only a first step. APL CIO Cindy Stoddard says the company, a wholly owned subsidiary of Neptune Orient Lines in Singapore, is talking with HP about ways to use the Adaptive Enterprise in its business.

"We're in the process of understanding what some of our business challenges are going to be in 2004 and how we can bring the right technology solutions into play," Stoddard says. The key way that utility computing will fit into APL's architecture is in its ability to expand and shrink infrastructure as necessary, she says.

"That's a real challenge for companies today: You have to invest up to a certain level in order to handle infrastructure needs at a peak, and you don't actually utilize all that capacity all the time," Stoddard says. "We have absolute challenges there."

Analysts say HP is rolling out some good products, but they question whether it might be promising too much to say it can bring harmony to the multiple organizations that make up a large corporation.

"In terms of deliverables, HP has a lot going for it. But those are deliverables at the infrastructure level," says Jonathan Eunice, principal analyst and IT adviser at Illuminata. "Where they've gone overboard is to say, 'And we'll do this for total business optimization.'"

HP admits that it doesn't have all the expertise in-house and is partnering with systems integrators, software makers and others to make it easier to respond to heterogeneous needs within enterprise data centers.

The real challenge is for HP to prove to customers what utility computing can mean for them, some observers say.

"A lot of people don't even know about [utility computing] yet. [HP] really needs to communicate to users what the products will do, how they will work and how that will benefit them," says James Maas, an OpenView solution architect for Precision Computer Services in Richmond, N.H. "Most people are very headstrong on how they manage parts of their network. This isn't going to happen overnight."

Learning to adapt

HP's Adaptive Enterprise strategy builds on a theme of the company's utility data center and adaptive infrastructure initiatives. Here's a sample of what's new:

- **HP Virtual Server Environment:** Built on the latest version of HP-UX Workload Manager, the software allocates virtual resources in response to application demand.
- **HP Software Self-healing Services for HP OpenView:** Enhances HP's network management software by detecting problems and recommending solutions. It will first be available for OpenView Operations and Network Node Manager, but will roll out for the rest of the OpenView line over time.
- **ProLiant BL20p blade servers:** The first blades with Xeon 3.06-GHz processors. The blades come with ProLiant Essentials management software, enabling automated control so that the blades can be provisioned according to demand.

HP says it hopes to spur customers along by assuring them that its approach doesn't mean a giant upheaval for IT systems.

"This is not a revolution," HP CEO Carly Fiorina said during last week's event in San Jose to launch its Adaptive Enterprise strategy. "This does not require companies to throw everything out. This does not require companies to make a major U-turn from the direction they have already started down, the path they have already chosen. This is a state of fitness that can be achieved in a very step-by-step, methodical way."

IT managers must look at the self-managing systems that vendors are promising, but they also must keep a skeptical eye, analysts say.

"HP's breadth and depth of offering is quite deep: It includes services; it includes virtual storage, virtual processing, server provisioning, management software and virtual application environments that will allow workloads to move from machine to machine as needed. It's a very comprehensive offering," says Dan Kusnetzy, vice president of systems software at IDC. "But it's hard for me to tell what are products that will be delivered immediately and what are products that will be delivered over time. We'll have to watch and see." ■

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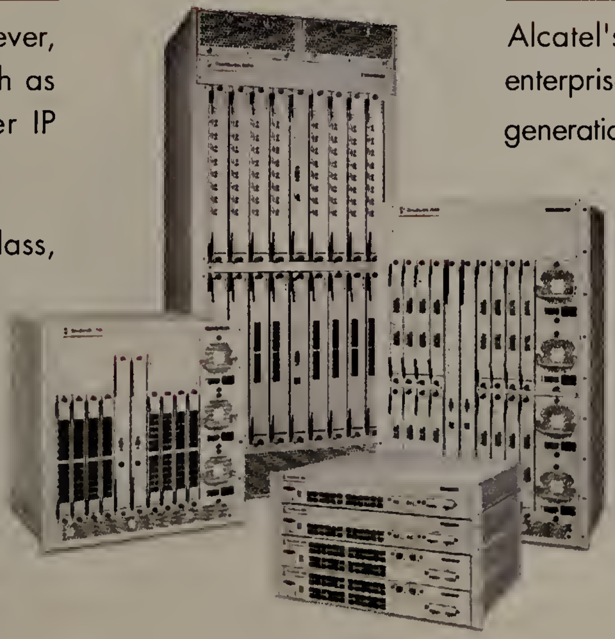

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Symantec releases security tools

■ BY ELLEN MESSMER

CUPERTINO, CALIF. — Symantec this week will announce two software packages intended to prevent security breaches.

Vulnerability Assessment 1.0 is a host-based scanning tool that resides on servers and desktops. It continuously checks software for vulnerabilities so it can be patched or protected by temporarily blocking ports. Costing $795 per server and $150 per workstation, Vulnerability Assessment competes against products such as Internet Security Systems (ISS) Scanner and Nessus freeware.

Symantec Incident Manager 2.0 is incident-tracking software that runs on Windows 2000 with information stored in a Lightweight Directory Access Protocol directory to access alert-data sent by security devices. Supported devices include Cisco and ISS intrusion-detection system products; Check Point and Cisco firewalls; Network Associates and Trend Micro antivirus software; and Symantec's host-based intrusion-detection, antivirus and policy-compliance products.

Incident Manager is the core component of the Security Management System, Symantec's security information management (SIM) product. Pricing starts at $75,000. Other SIM vendors include ArcSight, Computer Associates, eSecurity, IBM, Intellitactics and NetForensics.

Symantec says the updated Security Incident Manager adds real-time correlation of data that goes beyond simply gathering security-event information for viewing in a single console. ■

More online!

Firewalling and antivirus protection are a good start. But you need to do more. Joel Snyder joins the leading security companies to show you how to protect the entire enterprise.

DocFinder: 5845

IBM spinoff aims to secure servers

■ BY ELLEN MESSMER

BOCA RATON, FLA. — Start-up 14 South Networks — an IBM spinoff — this week is scheduled to debut a blade that slides into PCI-based servers and provides firewall and VPN protection based on Check Point technology.

The IntraLock blade — the first of its kind — replaces a network interface card, creating a way to set up an inbound encrypted connection to a server, determine firewall rules and stop inbound worms using Check Point's SmartDefense technology, the company says. IntraLock can be managed through the Check Point Smartcenter console or with 14 South's management tool.

Electronics maker Panasonic is using the IntraLock — in conjunction with more traditional perimeter firewalls — to protect its Web portal, which runs on multiple servers. IntraLock lets Panasonic protect individual servers directly, says George Oneid, central systems architect for Panasonic. That's preferable to counting on one firewall/VPN device to support all the servers, he says.

The blades also save space and reduce noise compared with traditional rack-mounted systems.

CEO and President Sterling Wharton says IntraLock, which works with servers from Dell, HP, IBM and Sun, is available in four models that cost between $1,000 and $4,500.

IntraLock 1 has one 10/100M bit/sec Ethernet port, but doesn't support a VPN terminated at the server. IntraLock 10-1 supports 10 simultaneous VPN terminations. IntraLock 10-3 supports two 10/100M bit/sec ports and 10 VPN terminations. The IntraLock 30 can terminate 30 VPNs at the server and has two 10/100M bit/sec or Gigabit Ethernet ports. ■

PROFILE: 14 SOUTH NETWORKS

Location	Boca Raton, Fla.
Founded:	In 2000 by Chet Heath, the company's chief technologist and formerly IBM's lead architect for the PS/2 computer and Micro Channel Architecture.
Primary business:	Security server blades
Funding:	$15 million from CrossBow Ventures, HIG Capital, IBM and Mellon Ventures.
Employees:	30
Fun fact:	As a spinoff from IBM, the company name connotes that the start-up is located 14 degrees south of IBM headquarters in Armonk, N.Y.

Microsoft offers peek at future wares

■ BY JOHN FONTANA

REDMOND, WASH. — Microsoft last week gave a glimpse, but few details, of two technologies that could help corporate users better manage and secure their networks.

At its annual WinHEC conference, the company demonstrated its Dynamic Systems Initiative (DSI), a self-managing environment, and its Next Generation Secure Computing Base (NGSCB), a combination of hardware and software for partitioning dedicated space on operating systems for secure execution.

The demonstrations proved that the technologies are evolving but also show that Microsoft has a long way to go in defining these plans and putting all the pieces in place. Experts say this will require cooperation from hardware manufacturers and software developers.

"This all seems like a huge undertaking [for end users]," says Jeff Allred, manager of network services for Duke University Cancer Center in Durham, N.C. "The idea behind Palladium [the code name for NGSCB] is a good one, but I want to see how it translates to shrink-wrapped products."

Allred says there are few Microsoft customers that could think about putting DSI components into place because it would take retrofitting or replacing existing infrastructure.

> **"This all seems like a huge undertaking [for end users] . . . I want to see how it translates to shrink-wrapped products."**
>
> **Jeff Allred**
> Manager of network services, Duke University Cancer Center

DSI is Microsoft's foray into utility computing, where it is trying to catch up with rivals such as IBM and Sun. The DSI architecture, which was introduced in March, includes System Definition Model (SDM), an XML-based technology that will let Windows-based applications, operating systems and management tools communicate with each other to keep a network running smoothly.

"DSI is very analogous to the early days of .Net," says Dwight Davis, an analyst with Summit Strategies. "It's a sweeping vision and it's not really clear how you get from Point A to Point B."

At the show, Microsoft displayed a software prototype called Dynamic Data Center (DDC) that uses SDM and is an extension of forthcoming provisioning technology called Automated Deployment Services. There, DDC was used to create a self-managing environment using HP StorageWorks arrays, HP ProLiant Servers and HP ProCurve switches.

To roll out an application, DDC allocated servers, initiated an operating system installation, and configured the storage array and network switches as part of automating a process that could take days to complete manually, Microsoft says.

"This is our first proof of concept that shows how DSI plays out for the customer," says Bob O'Brien, group product manager for Windows Server.

Microsoft gave a similar proof of concept with NGSCB. The company demonstrated its software called nexus, which creates a secure section on operating systems dedicated to single applications. The demonstration required emulation software to mimic the hardware requirements to support NGSCB, which include chips in development by Intel and Advanced Micro Devices.

Microsoft plans to release an NGSCB software developer's kit in October and have the technology ready for the Longhorn release of Windows, which is slated for 2005.

"The biggest challenge is for Microsoft to define what NGSCB is and what are the benefits," says Chris Christiansen, an analyst with IDC. "It's the equivalent of a hammer, and customers and partners have to figure out where the nails are."

But Christiansen says the technology could have tremendous benefits for corporate security, especially securing endpoints such as laptops and other devices that are routinely entry points for malicious code.

"[NGSCB] is a breakthrough," said Bill Gates, Microsoft's chief software architect, during his keynote presentation. "It's a breakthrough that will allow for privacy guarantees, will allow for document distribution control." ■

Be a Net Know-It-All

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States

continued from page 1

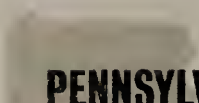
Here are some state-by-state highlights:

CONNECTICUT
Database for criminal justice

The state recently completed a shared Oracle database for criminal justice agencies, including police, prosecutors and public defenders. The challenge was to make sure access was properly segregated among 12 different state agencies to rule out scenarios such as the public defender accessing the district attorney's case files.

Also for the criminal justice system, the state implemented a fingerprint ID system that moves a lot of image files, boosting the need for bandwidth to the fingerprint database. Also boosting bandwidth demand is the Department of Children and Families. The state agency is increasing its head count, despite 6,000 state government layoffs. The problem is that the department's software is bandwidth-intensive, which will likely require re-engineering of the network. "It's the ultimate thick client," says Robert Dixon, director of operations for the Department of Information Technology.

Also coming up is a shift in the state's auto-inspection structure, moving from 15 test sites statewide to more than 400 located at dealerships and garages. "That's going to be its own networking adventure," Dixon says.



PENNSYLVANIA
Benefiting from fiber

The state is two years into a five-year, $288 million contract with Telcove to install and manage a statewide fiber WAN, says Valerie Long, assistant director of support services and network planning for the governor's Office of Administration. The company bid to provide the state a set of services, and the state knew that would require extensive fiber builds to rural locations that otherwise would not lure providers. Most of the network is built and is supporting 80% of the services required by state agencies. The new fiber WAN also enables Telcove to offer broadband service in rural areas on the same network, which the state encouraged.

Long says she is concerned that the cost of access lines to the fiber network could change because of the recent Federal Communications Commission ruling that would affect the rates that traditional local carriers can charge for the equipment and services they lease to competitors, such as Telcove. The complicated FCC decision warrants a thorough look, she says.

After an agonizing year of transitioning from leased lines to the new fiber network, Long is hoping to reach a steady state in which services are delivered routinely and staff can focus on development. A complicating factor is that because bidding the contract is such a complex project, it is nearly time to start preparing the next RFP for the WAN.

A push is afoot to encourage state agencies to adopt a common enterprise standard for equipment so that as a group they can get better deals from vendors. "There are economies of scale to be had, but it's difficult to implement enterprise policies because of [departmental] fragmentation," Long says. The state also is looking for a site for a back-up server farm as a fallback for the primary one in Harrisburg.

WEST VIRGINIA
Web security tightened

A hacker hit on the state's site prompted a security assessment that exposed unsuspected vulnerabilities, including Web servers being run off PCs in the state network, a contractor using the state's Internet access for its own business, and network devices unwittingly exposed to the Internet. These problems have been corrected and an intrusion-detection service hired to guard against future incursions, says Deepesh Randeri, the state's CTO. One hurdle yet to overcome is that the intrusion-detection provider needs to check with state workers to determine whether behavior deemed suspect on the network is authorized, such as a PC in one office trying to access the C drive of a computer in another office.

With 23 videoconference sites already on the state network, agencies are trying to expand use of them to save money in a variety of unexpected ways. One cabinet secretary used videoconferencing to deliver a policy message to department workers rather than spend a day driving around the state to do it in person. The courts are doing video arraignments, the Child Welfare Department is setting up distance meetings with counselors, and state psychiatrists are meeting with patients via video, Randeri says.

VERMONT
Backing up data centers

The state is building a back-up data center in Barre that will mirror the mainframe in the state capital, Montpelier. These sites will be connected by an OC-3 link that will double as the backbone of GovNet, the state's government WAN, says Hale Irwin, telecommunications chief at the state's Communications and Information Technology division.

The state is looking for a way to figure a usage-based chargeback to departments for the bandwidth they consume on the state WAN, Irwin says. On the voice side, the state is looking for a system that would better manage billing.

The state also is beefing up its physical security with ID cards and video surveillance that will start in the capital and be expanded throughout the state.

DELAWARE
Voice XML is hot

The state has integrated XML content formatted for its Web site with its automatic voice-response phone system to offer taxpayers information more efficiently. This enables the public to get by phone the same information that the Web site offers, without involving live operators, says Kay Buck, business office team leader at the Department of Information and Technology. "We can use it for things already on the Web without having to rewrite the entire application," Buck says.

Service on the new system include locators for voting sites, where to file taxes and where to get free tax help. Features of the system also include frequently asked questions about state taxes, finding status of tax returns and where to find a free, public computer that has Internet access.

"It works like a champ," Buck says, and if the state comes up with enough applications, the voice XML project could warrant full-time programmers.

On other frontiers, the state is continuing a migration from its legacy Beyond Mail e-mail and Ontime calendaring platforms to Microsoft Outlook. It also is migrating from the state's Switched Multimegabit Data Service WAN to frame relay and ATM.

NEW JERSEY
Wireless highs and lows

The state has a growing demand for cell phone use — from 3,500 last December to more than 5,000 today, because they now are issued to all child social-welfare workers. Via hard scrutiny of cell phone use, the state determined the best mix of standard calling plans would give the state the 3 million aggregate calling minutes it needed. The analysis also ensured that the state gets the best average price per minute, says David Blackwell, telecommunications manager in the state's Information Technology Office. The plans are resold to the departments . that need the phones at a savings over what they would have paid if they bought separate plans without aggregating minutes.

A different state wireless network — which supports state police cruisers and state highway department vehicles in the northeastern part of the state — was wiped out by the World Trade Center attack that took down the state broadcast antenna. The network still is running on the emergency replacements set up immediately after the attack, and the state is looking at a $30 million project to find a permanent fix, Blackwell says. The upside is that the new system will be entirely digital and support more microwave channels than the old one. ■

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IT job picture remains bleak

■ BY DENISE DUBIE

IT job seekers should expect no relief through year-end, according to recent research reports that offer little hope of increased budgets and that say more jobs will be lost to overseas outsourcing.

Goldman Sachs surveyed 100 IT executives about forecasted spending and the results showed about half of respondents reducing IT spending throughout 2003. Spending projections in April dropped to a negative 3% from a dismal 1% growth in February.

The Information Technology Association of America (ITAA) reports that demand for IT workers continues to drop. According to the ITAA, 400 hiring managers surveyed said they would only look to fill 493,000 positions over the next 12 months — down from 1.6 million at the start of 2000. Sixty-seven percent of the 400 managers surveyed nationwide said they thought the demand for hiring would remain the same or decline in the next 12 months.

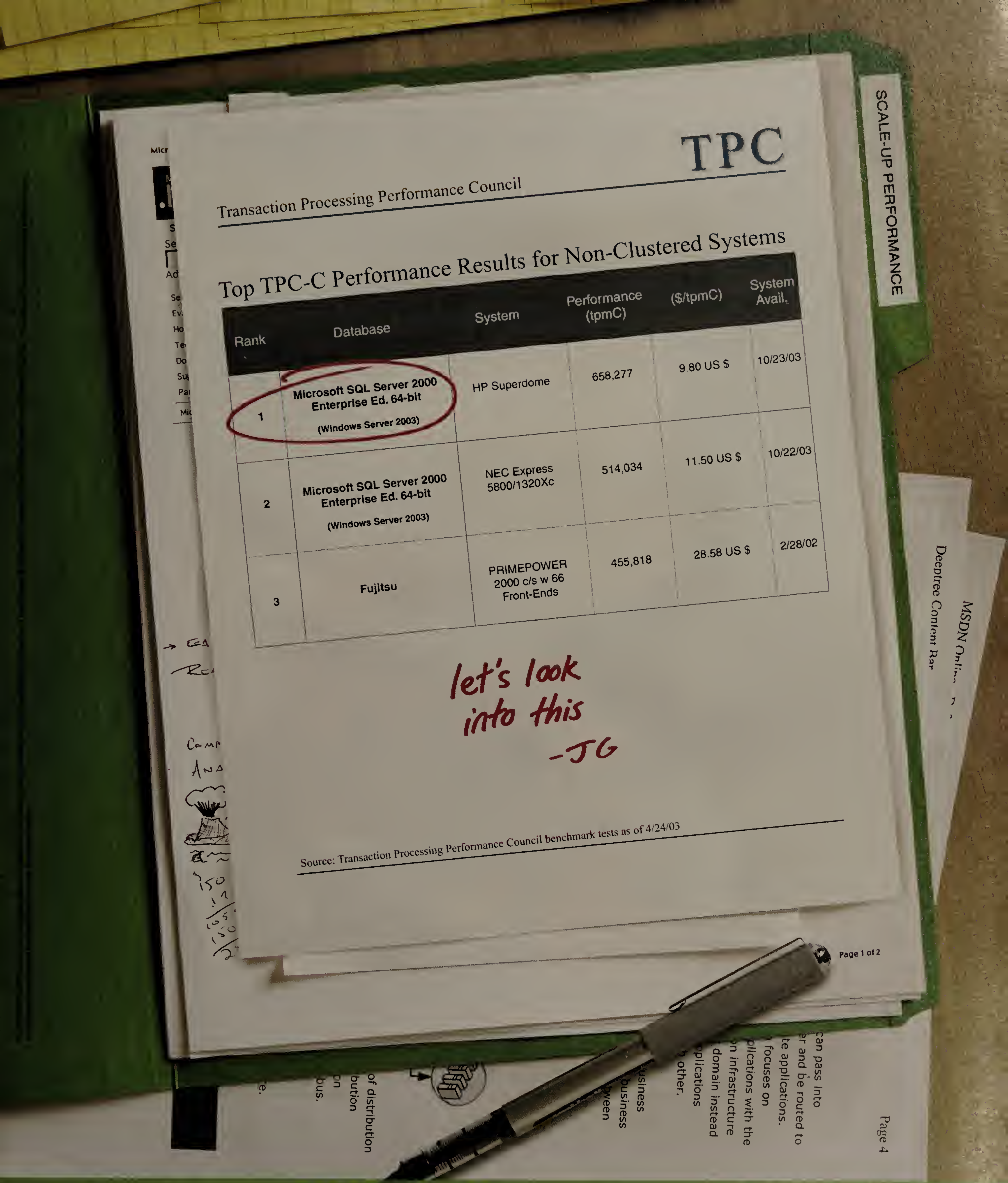
Perhaps more disturbing for U.S. workers is evidence that more companies plan to outsource IT functions to overseas locations. The ITAA found 22% of respondents have moved work offshore, and 15% have opened operations overseas. Another 19% were undecided about whether to move their IT duties outside of the U.S.

People3, a research firm that tracks IT employment and compensation, also notes the trend toward outsourcing.

"From an employee standpoint, there will always be some concerns, but right now, outsourcing to me is a big one," says Diane Berry, managing vice president for People3.

Recent People3 research shows IT turnover, positions and pay have stabilized for the most part in 2003, but hiring managers are still challenged to find candidates with specific skills. The top five difficult-to-hire positions are database administrator, Internet/Web architect, network architect, network engineer and security analyst.

Berry says hiring managers expect candidates to have IT and business skills. People3 advises job seekers to brush up on behavioral and business skills and to keep their technical skills up to date while job searching. ■



Transaction Processing Performance Council

TPC

Top TPC-C Performance Results for Non-Clustered Systems

Rank	Database	System	Performance (tpmC)	($/tpmC)	System Avail.
1	Microsoft SQL Server 2000 Enterprise Ed. 64-bit (Windows Server 2003)	HP Superdome	658,277	9.80 US $	10/23/03
2	Microsoft SQL Server 2000 Enterprise Ed. 64-bit (Windows Server 2003)	NEC Express 5800/1320Xc	514,034	11.50 US $	10/22/03
3	Fujitsu	PRIMEPOWER 2000 c/s w 66 Front-Ends	455,818	28.58 US $	2/28/02

let's look
into this
-JG

Source: Transaction Processing Performance Council benchmark tests as of 4/24/03

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Avaya scales up its VoIP support

■ **BY PHIL HOCHMUTH**

BASKING RIDGE, N.J. — Avaya this week is increasing the scale of its IP PBX to help customers support more remote offices over WAN connections, and more IP phones over a LAN.

An upgrade to Avaya's Communications Manager software, which runs on its S8700 and S8300 IP PBXs, and traditional Definity PBXs, can increase the number of remote offices tied to an Avaya IP PBX fivefold while letting remote-office gateways support twice as many IP phones. Avaya also is introducing an applications server for adding interactive voice response (IVR) software to a converged network as an end-user productivity tool.

The new Communications Manager software running on Avaya's S8700 — a Linux-based central-site IP PBX — now can support up to 250 remote offices, provided that the sites have Avaya's G700 remote gateway. The G700 is a chassis that can provide IP public switched telephone network (PSTN) and voice-over-IP (VoIP) connectivity via an IP WAN remote office.

The gateway can be configured with a S8300 IP PBX processing blade, which supports up to 450 IP phones in a branch office. If WAN connectivity to a central site is lost, the S8300s can take over and provide full telephony features and PSTN access for branch users. New software for the S8300 can increase the number of phones that can run off the box from 250 to 450, the company says.

Avaya has renamed the software running its IP PBXs and PBXs from Multivantage to Avaya Communications Manager. The brand Multivantage will encompass Avaya's family of convergence products, from IP PBX hardware and software to applications, voice mail, unified messaging and Communications Manager product.

"Avaya is delivering on what it promised almost a year and a half ago," says Brian Riggs, senior analyst with Current Analysis. He says the scalability increases are significant for Avaya if it wants to challenge Cisco in the IP telephony market and convert its own customer base from PBXs to IP PBXs. "They'd better scale up to that level if they want to market [the S8700] as the IP equivalent to the Definity," he adds.

The increase in support for remote sites is still important, Riggs says, because Avaya's G700 and S8300 product solution for remote-site survivability is one of the vendor's best technologies.

"Avaya's survivability story is strong," Riggs says. "It's even better than Cisco in many respects," he adds, referring to Cisco's Survivable Remote Site Telephony technology for support of remote offices with VoIP. He says that Avaya's remote sites can offer local IP phone users more features in the event of a IP WAN connection failure than Cisco's technology.

Avaya also is announcing a new IVR server application. The Avaya Speech Access server is software that runs on a Windows 2000 Server and lets the S8700's calling features be accessed with voice commands, either from an Avaya IP phone or via a PSTN call to an access number on the IP PBX. The server can let end users call other employees by name. If integrated with a voice mail or e-mail server, Avaya Speech Access can let end users browse through and delete voice mail and e-mail messages with voice commands.

Avaya says the Speech Access server will cost $12,000, including hardware, with 200 free licenses. Additional licenses cost $3 per month, per user. Avaya says the IP-based software allows for a less expensive IVR deployment because speech-recognition features on its TDM-based systems in the past cost about $30 per user, per month.

Software upgrades for the S8700 and S8300 IP PBXs are free to customers with maintenance contracts. ■

EMC

continued from page 1

deal-by-deal basis for as much as a year, covers EMC's Celerra, Clariion and Symmetrix arrays and its Connectrix switches.

"These programs are very appealing . . . because they give you the flexibility to increase resources without having to buy a lot of equipment, not buy enough, or pay for it before you need it," says Steve Rubinow, CTO for Archipelago, an online stock market in Chicago.

Rubinow, who has EMC, HP and IBM storage in his organization, is considering a metered lease program he says HP will introduce for HP storage arrays. He says HP has talked to him about two options it has. One program — the Capacity on Demand for StorageWorks-Financing Option — lets users lease increments of storage capacity as they expect they will need it. The other program, which is unannounced, uses a metered approach, which lets it more accurately reflect usage patterns.

"HP apparently has software that reads your system and tells the company how much storage capacity you are using, just like an electric meter," Rubinow says. "Those are great approaches for us to invoke storage when we need it and pay for it then."

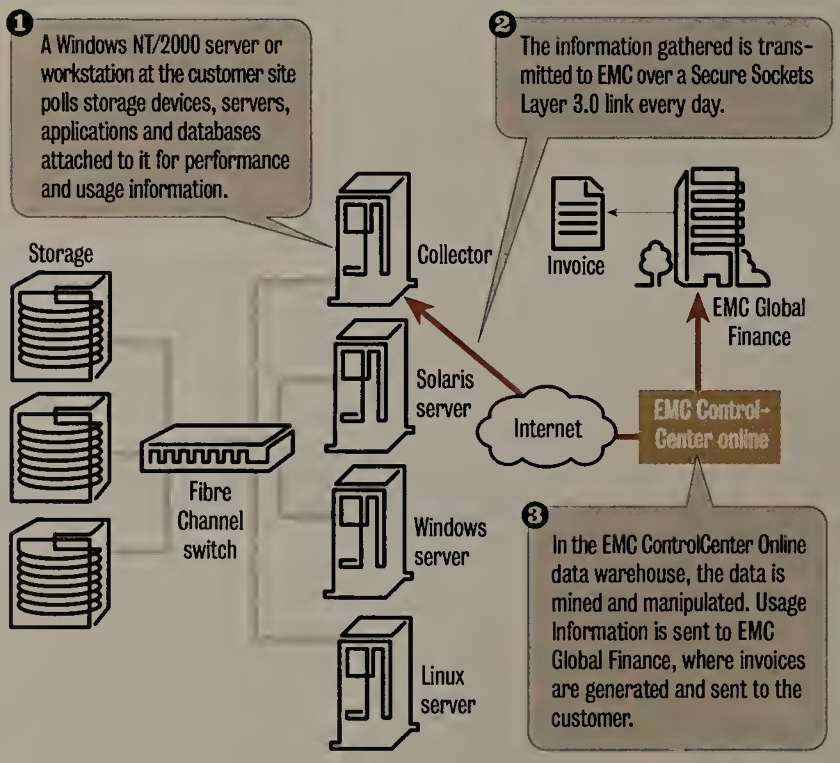
Details of these financing programs are not made public, sources say, because obtaining them depends on factors such as a customer's credit rating, account history, volume of equipment installed and the size of the potential sale. Traditionally, storage companies such as IBM and Hitachi Data Systems have offered on-demand storage services that, like HP's, are based on customers activating increments of storage when they need them and reporting the increased capacity to their representatives.

Analysts say there are problems with this approach that are eliminated with a metered method.

"The problem with financing storage assets is you have to rely on customers' honesty when they turn on the next gigabyte of capacity," says Brian Babineau, a research analyst for Enterprise Storage Group. "[EMC's OpenScale] is the first real product to facilitate on-demand financing by providing accurate details of storage capacity."

EMC's utility-class storage

OpenScale allows the leasing of storage based on usage.



① A Windows NT/2000 server or workstation at the customer site polls storage devices, servers, applications and databases attached to it for performance and usage information.

② The information gathered is transmitted to EMC over a Secure Sockets Layer 3.0 link every day.

③ In the EMC ControlCenter Online data warehouse, the data is mined and manipulated. Usage Information is sent to EMC Global Finance, where invoices are generated and sent to the customer.

Babineau says metered storage use works the same way as an electric or water utility. Seasonal spikes in electrical consumption would be balanced with other months to reach an equitable rate that reflects the industry norm.

OpenScale makes use of EMC's Online ControlCenter service, which places a server or workstation at a customer location to monitor usage and performance information. This server, called the Collector, polls storage devices, servers, applications and databases on the network every hour. It then gathers the information and feeds it to a data warehouse located at EMC, where the data is mined for a variety of purposes. In an OpenScale customer's case, data is gathered, transmitted to the EMC data warehouse and then transferred automatically to EMC Global Finance so invoices can be generated based on the usage pattern.

"The capability of OpenScale is extremely vast," says Jamie Gruener, a senior analyst with The Yankee Group. "In some ways, it's unfortunate that EMC has not announced it, because it would help them create a great story for utility computing and the on-demand environment. With all the noise that is out there, OpenScale is much more advanced than what other vendors have."

EMC this week also is scheduled to announce products related to OpenScale and its Online ControlCenter services. The products, called SAN Architect and AutoAdvice, could help users design and deploy storage-area networks (SAN), and better monitor and manage storage networks' performance.

Like OpenScale, AutoAdvice and SAN Architect use the Collector. AutoAdvice, a technology EMC acquired through its purchase of Luminate that formerly was called EMCLink, is a Web service customers can subscribe to that lets EMC access their servers, storage, databases and applications, so performance-related problems can be headed off before they happen. AutoAdvice works with any direct-attached, network-attached, JBOD or SAN storage.

Initially, it also will poll information from SAP R/3, Oracle, Microsoft Internet Information Server, Exchange and SQL Server running on Windows, Unix or Linux servers. It will monitor EMC Clariion, Symmetrix, Celerra, HP StorageWorks and Network Appliance file servers, and Brocade, Inrange and McData Fibre Channel switches. EMC is in the process of qualifying Cisco's switches and other arrays from Hitachi, HP and IBM.

AutoAdvice creates a daily report and stores data in the Intelligence Center, which then generates historical reports so customers can see how their systems are working over time.

SAN Architect, the other new Online ControlCenter service, is a design and deployment configuration tool that lets users create trial configurations before they deploy or expand a SAN. It outputs configuration information to many sources, such as Microsoft Visio. ■

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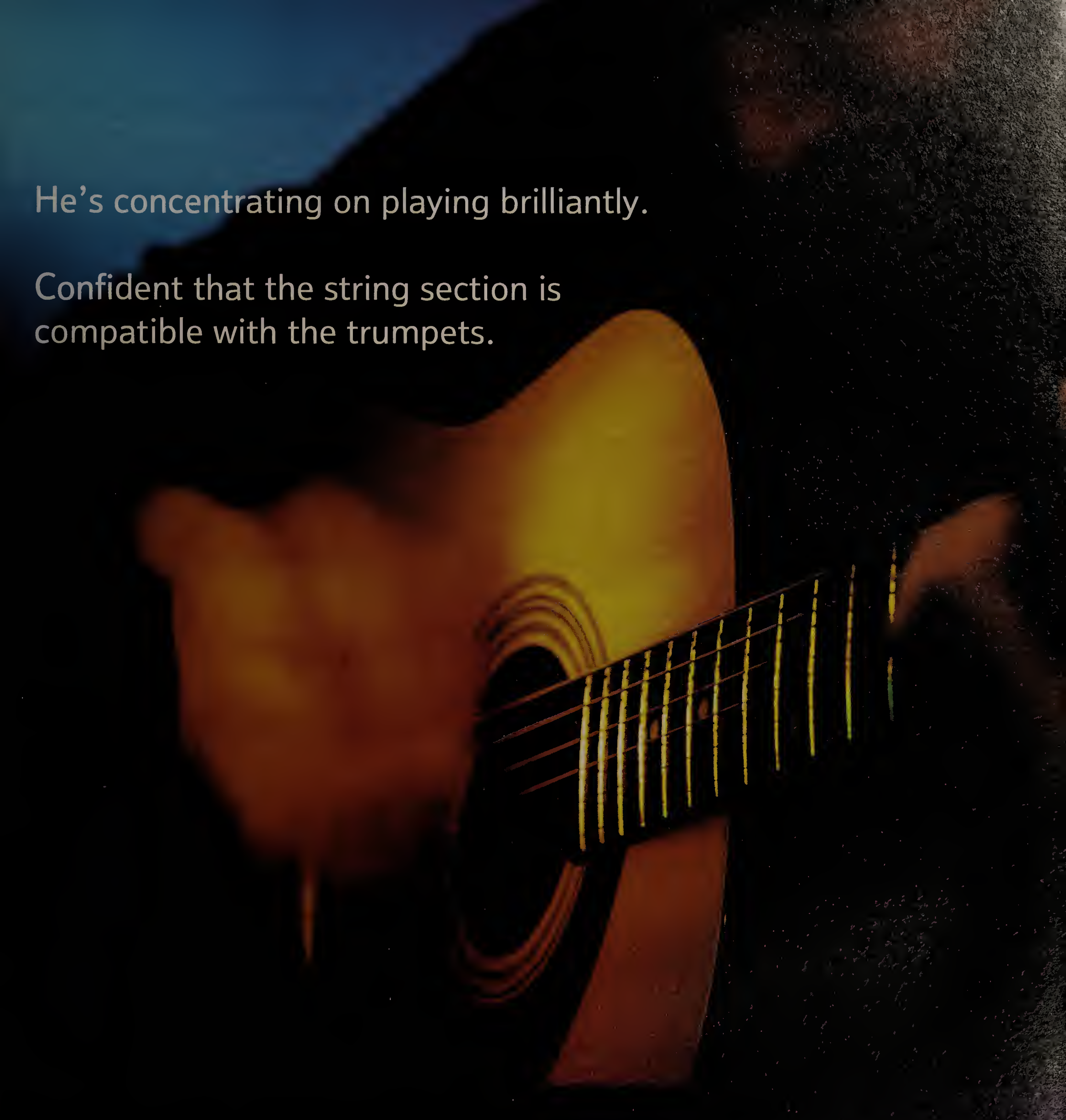
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NWD-IT3

Dave Passmore is the Virginia-based Research Director for the Burton Group. Named one of Network World Magazine's "50 Most Powerful People in the Networking Industry," Passmore is Burton Group's "thought leader" in the area of network architecture.

UNISYS PRESENTS

ask THE EXPERT

A few minutes with Dave Passmore, Research Director, Burton Group

Mobility—Access Anywhere, Anytime

> The term "mobility" is being used in many different contexts. How do you define it?

Increasingly, the meaning of mobility is becoming aligned with the concept of "untethered communications" — it assumes portable devices that will support some type of wireless voice or wireless data networking functionality. Mobility implies the use of wireless LANs, cellular phone systems or various wireless wide-area or metro networking services. Ultimately, mobility will permit a device such as a laptop computer or personal digital assistant (PDA) to seamlessly roam between these various wireless communications systems without the user having to reconnect or login again. In this context, wireless geographical coverage will be ubiquitous.

> Public Wi-Fi (802.11) wireless networks are emerging as an attractive alternative to cellular networks. What are the benefits driving this growth? What are potential barriers to Wi-Fi's successful deployment as a public carrier service?

The emerging industry view is that public Wi-Fi networks will be complementary rather than competitive to cellular networks: In fact, many of the public Wi-Fi hotspots are allied with or operated by cellular carriers in an attempt to provide comprehensive local and wide-area wireless coverage along with a single monthly bill for customers. Wireless LAN (WLAN) hotspots are becoming extremely popular due to their ease of use and the abundant Internet access bandwidth provided — more than 10 times what's provided by the latest cellular data network offerings.

> Convergence of voice and data communications is accelerating on traditional wireline networks. Do you see convergence on wireless networks also gaining wide acceptance? How soon?

Voice/data convergence is already happening in the wide area, as next-generation 2.5G and 3G data networking services are being added to cellular voice networks. But many businesses are expected to implement their own converged wireless networks that support Wi-Fi phones. Some issues must be addressed to ensure traditional "total quality" voice, but these challenges should be worked out with products that implement the new 802.11e WLAN quality of service standard within the next two to three years.

> Enterprise-wide deployments of WLANs can become very complex to implement and manage. Do you see a strong market opportunity for managed services of WLANs?

Some organizations will choose to outsource the management of their WLANs in the same way that they outsource managed services for their wired LAN and WAN infrastructures. However, one of the hottest new technology developments may address much of the WLAN complexity issue. About a dozen vendors (startups and established vendors) have introduced "WLAN switches" that re-architect a site's WLAN environment into a single integrated system and simplify the administration, security and deployment of complex WLAN environments. Of course, the installation and life-cycle management of these next-generation WLAN systems also represents an opportunity for managed services providers and systems integrators to provide their expertise in this sector.

> The adoption of wireless-enabled devices (both laptops and PDAs) is creating a management nightmare for IT to support. Do you see the management of mobile devices as another strong market opportunity for managed services?

The management of laptops and PDAs is certainly much more complex than it used to be; operation often requires "locking down" these devices so that they can't pick up stray viruses, and to ensure that appropriate security measures are used. An important issue is establishing comprehensive security policies for wireless-enabled devices — particularly when employees want to purchase and use their own low-cost PDAs or laptops on corporate networks. Many organizations are turning to managed services providers for help in this area.

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Venture funding drying up for start-ups

■ BY BOB BROWN

MoneyTree QUARTERLY Venture capital Survey

Venture funding for network start-ups hit a five-year low in the first quarter, as investors remained cautious in light of a continued industry malaise, concerns over the war in Iraq and the U.S. economy.

Venture capital firms put just more than $2 billion into network companies in the first quarter vs. $2.3 billion in the fourth quarter and $3.5 billion in the first quarter of last year, according to an analysis of the MoneyTree Survey compiled for *Network World* by PricewaterhouseCoopers, Venture Economics and the National Venture Capital Association.

The number of network start-ups invested in during the first quarter — 331 — is the fewest since the analysis of the survey began in 1997.

"Until we see customers start buying again, we're going to be stuck at these funding levels," says Tracy Lefteroff, global managing partner of the venture capital practice at PricewaterhouseCoopers. "Venture firms are also holding back new investments until they see some liquidity out there and that's only going to happen if M&A and IPO activity pick up."

Vendors need to show they can deliver customers an immediate payback to attract funding, Lefteroff says. Among the few segments faring well are storage and security, he says.

While carrier equipment suppliers such as Axiowave and Calix landed big funding rounds (see graphic), severe cutbacks in carrier spending have made it hard for many such companies to attract investment.

"Carriers have lots of upgrading to do, but the question is: When are they going to free up their budgets to do that?" Lefteroff says.

Lefteroff says investments during the current quarter could turn out even lower than in the first quarter. "It's not looking rosy from the data we're seeing," he says.

One company that has managed to get funding this quarter is KMV Technologies, a stealthy Austin, Texas, vendor of video products and services. KMV pulled in $18 million in first-round funding from Austin Ventures, Norwest Venture Partners and Redpoint Ventures. Craig Malloy and Michael Kenoyer founded the company, having previously played key roles at conferencing companies Vtel and ViaVideo (now part of Polycom). Vab Goel, a venture partner at Norwest, also is a founder.

Goel says that while videoconferencing seems like it's been around forever, the timing has never been right for it to flourish because of chip costs, bandwidth constraints and other factors. "With the business world becoming more distributed and with more demand for real-time communications, this is the best time to invest in companies that work around video," he contends. He also says there is no clear leader in the market, leaving the door open to newcomers.

"You're making a mistake if you think you always have to do something new from an idea perspective," he says. "When something is totally new and looks like a no-brainer, that's actually the thing you don't want to invest in." ■

Money winners

Top 10 venture rounds for network start-ups in Q1.

For a complete listing of network start-ups funded during Q1, see DocFinder: 5846 www.nwfusion.com

Company	Focus	Funding (in millions)
Matrix Semiconductor	3-D integrated circuits	$52
Calix Networks	Products for accelerating fiber-based networks	$50
Axiowave Networks	Core optical network gear	$45
Photuris	Metropolitan core and regional transport systems	$40
Groove Networks	Collaboration software	$38.3
Ikanos Communications	Silicon for delivering broadband access over copper wiring	$30
Entropic Communications	High-bandwidth, in-home communications	$26
NetContinuum	Web application security	$26
Photonic Bridges	Optical and broadband network equipment	$23
Starent Networks	Datacommunications equipment for wireless networks	$23

Check Point digs deep into packets

Software aims to protect Web servers, e-mail, instant messaging from attacks.

■ BY TIM GREENE

REDWOOD CITY, CALIF. — Check Point next month is set to give its firewall customers the ability to detect and block application-layer attacks such as Code Red, Nimda and SQL slammer worms.

Called Next Generation with Application Intelligence (NGAI), this release of Check Point's Firewall-1 SmartDefense software is designed to protect Web servers, e-mail, instant messaging and FTP from a variety of attacks such as HTTP encoding, directory traversal and FTP bounce.

The application intelligence is in the software that is part of the firewall located at the network Internet connection. This software digs deeper into packets than the firewall and can adjust firewall policies to block attacks it detects.

"[NGAI] firewalls are able to delve somewhat deeper into the packet, do some simple signature matching and pattern matching, but also do some advanced protocol analysis looking for anomalies, be it extended ASCI characters in an HTTP stream or HTTP headers that are much bigger than they should be," says Scott Loach, senior information security engineer for financial advisory firm Raymond James Financial Services in St. Petersburg, Fla., which beta-tested NGAI.

He says the new features were part of the default settings of the beta version of NGAI that he tested, and they add another layer to his network defenses. "The next thing that comes in like SQL slammer or Nimda is going to come in over a common port like Port 80 or 110 or 25. A normal firewall is just going to permit the traffic."

He says NGAI doesn't displace the firm's other security, which includes an intrusion-detection system, antivirus software, mail filtering and URL filtering.

The new capabilities will let Check Point compete against other leading firewall vendors Cisco and NetScreen, says Richard Stiennon, an analyst with Gartner.

Other vendors focused on using custom chips to rip packets apart, inspect them and apply multiple policies more thoroughly than NGAI does will ultimately have the edge, he says. These include Fortinet, Netcontinuum, Tippng Point and to some extent content switches, such as Blue Coat Systems and F5 Networks.

NGAI is available June 3. An update subscription costs $1,000 per gateway or $10,000 for up to 100 gateways. ■

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Short Takes

■ A new package of software and services from **IBM** will help customers support the use of wireless mobile devices. Called **Mobile Office Entry Jumpstart,** the new program is targeted at companies that want to get started with mobile computing. For $100,000, companies will get new versions of IBM's WebSphere Everyplace Access and Everyplace Connection Manager software, 50 Palm Tungsten PDAs and cards that let the devices connect to wireless networks, IBM says. For small and midsize businesses, packages containing fewer clients also are available, although no pricing information is available below the 50-client level. A feature has been added to the Access product called Intelligent Notification Services, which can forward information from e-mail, supply chain or other legacy systems to a preferred mobile device, IBM says.

■ **FIA** is rolling out a new network-attached storage appliance that has as much as 2 terabytes capacity in a 2U-high enclosure. The **POPnet-server 8000** is based on FreeBSD and works with data from Windows, Linux, Unix, NetWare v3.x and Macintosh networks. It has dual processors, Gigabit Ethernet adapters, redundant fans and power supplies. The POPnetserver ships with snapshot back-up and replication software. It starts at $8,000 for a single-processor version.

■ **Fujitsu** and **Red Hat** say they plan to strengthen their ties with an extensive partnership in sales, marketing, support and engineering. The goal is to enhance how their products work together, how they sell and support each other's products, and how Red Hat's software performs in data centers, which require hardware and software of the highest reliability, availability and scalability. Red Hat has similar partnerships with Dell, HP and IBM. Fujitsu doesn't have a similar partnership with other vendors of Linux enterprise operating systems but has sold Primergy servers with Red Hat operating systems since March 2001.

Early users give iSCSI thumbs up

■ **BY DENI CONNOR**

iSCSI
EARLY ADOPTERS

The iSCSI protocol has gained momentum as an alternative for Fibre Channel storage-area networks, and early adopters like it for the same reasons they like Ethernet — it's inexpensive and easy to install.

The idea behind iSCSI is to let users have universal access to storage devices and SANs over standard Ethernet-based TCP/IP networks. Approved by the Internet Engineering Task Force (IETF) as a standard in February, the protocol can be deployed effectively to host the traffic of Microsoft SQL databases, Exchange messaging or Oracle applications, users say.

Sean Wilde, director of global IS operations for Global Positioning System manufacturer Trimble Navigation in Sunnyvale, Calif., has just completed a beta test of iSCSI. He says that based on the results, that he's ready to migrate his storage to iSCSI for its familiarity, cost and performance.

"The average Windows NT system engineer can spell SCSI, but not Fibre Channel," Wilde says. "From my point of view, this is a technology that my technical staff is comfortable with and is competent to work with without any extensive training, unlike Fibre Channel. The iSCSI technology doesn't breed any fear, uncertainty or doubt from the systems people."

Wilde beta-tested three Adaptec iSCSI AHA-7211C adapters on three Windows NT servers. In his configuration, each server contained an iSCSI adapter that attached to iSCSI-enabled Network Appliance file servers via a Dell PowerConnect 5012 Gigabit Ethernet switch.

Over the course of this summer when Wilde can get some of his servers off-line for maintenance, he will migrate direct-attached storage from 125 Dell PowerEdge servers to Adaptec iSCSI adapters and Network Appliance file servers. He is looking to consolidate Oracle development databases on the file servers and eventually will put Oracle production and Microsoft Exchange data on the file servers.

Wilde can make a good business case for network-attached storage (NAS) and iSCSI.

"There's a lot of churn and replication of the data and a lot of hand work — places where there's manual intervention," he says. "I want to use NAS, but I want something that performs very well — iSCSI seems to be the best fit at the best cost."

While Wilde says he could implement his plans using NAS alone, he says that the performance he gets from iSCSI is far better.

"ISCSI gives me the high performance access to the file server at a fairly low protocol level," Wilde says. "Our perception

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ISCSI toolbox

As many as three types of gear are necessary for building an iSCSI network. StorageTek's EchoView is the newest array to use the iSCSI protocol.

Type of product	Vendors	Characteristics
Host bus adapters	Adaptec, Alacritech, Emulex, Intel, Qlogic	Autonegotiating 10/100/1000M bit/sec speed.
Switches/ routers	Cisco, Nishan, StoneFly, SANRAD	Can cluster for failover, connect to SCSI, Fibre Channel or ATA drives.
Target arrays	Adaptec, Network Appliance, IBM, StorageTek	Eliminates necessity for switch or router.

IBM powers up Unix servers

■ **BY JENNIFER MEARS**

ARMONK, N.Y. — IBM improved the high end of its Unix server family last week with more powerful CPUs and flexible pricing options that let users buy pSeries boxes with processors that are turned off until they're needed.

Big Blue last week announced updates to its 64-bit pSeries systems, the p690, p670 and p655. All three run with the faster clock speeds of IBM's Power4+ chip, which is now available at 1.5GHz and 1.7GHz.

The new p690, available with 1.5-GHz or 1.7-GHz processors, costs $494,000 for an eight-way configuration with 1.5-GHz processors, 8G bytes of memory, two 36G-byte disk drives and IBM's AIX operating system. The server, which IBM says provides a 65% performance increase over its predecessor, is aimed at customers looking to consolidate servers and those running large, single-system applications.

The midrange p670 starts at $190,000 for a four-way configuration with 1.5-GHz processors, 8G bytes of memory, two 36G-byte disk drives and AIX. The new p690 and p670 will be available May 30.

The ultradense, cluster-optimized p655 is available with either the 1.5-GHz or 1.7-GHz processors and starts at $50,000 for a four-way configuration. It will be available in late July.

On-demand pricing

While IBM undoubtedly has boosted the performance of its pSeries systems, the real news is IBM's expansion of its on-demand pricing model, says Joe Clabby, of Clabby Analytics.

"IBM is able to package additional processors and additional memory onto those servers such that when the business needs to expand, they can start to pay for that additional capacity. So they don't pay anything until they need the capacity, and then it's there on demand. They don't have to order, they don't have to install, and they don't have to configure," he says.

Clabby says IBM is making on-demand more flexible for customers by offering on/off capacity on demand, and a try and

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TOLLY ON TECHNOLOGY

Kevin Tolly

Testing's bottom line

As products become more complex, testing becomes more important. We strive to tally the pluses and minuses to come up with a bottom line on a product. But it doesn't often work that way anymore. The bottom line on testing today is that there isn't a bottom line.

The bottom-line approach, taken in a typical product review or bake-off, assumes all the various attributes of a product can be probed, graded and tallied into a single number (or small set of numbers). This gives us the testing version of the accountant's bottom line and becomes the basis for publication awards and the like.

Only when the products being compared are explicitly targeted at the same market and implement the same architecture and technology does this approach have a chance at working. And such situations are rare. The higher up the stack you go, the less viable this monolithic approach becomes.

It's one thing to establish a set of mandatory criteria for evaluating a group of Layer 2 switches where the core criteria are mandated by standards, and there's simply not room for massive implementation differences. It is quite another, say, for a tester to decide that certain features are mandatory for products as inherently complex and often implement fundamentally different architectures and philosophies such as intrusion-protection systems (IPS).

The more complex the system, the more that bias becomes a factor. There's no way around the fact that, when evaluating at a product in toto, a gold standard needs to be established against which the product and its features are rated. Creating that description of the perfect product is unavoidably an exercise in building a bias.

In many cases, creating the gold standard requires the tester to choose among various philosophies. These choices might determine the winner even before the first box is unpacked. A tester who's decided that antivirus functionality has no place in IPSs will award no "points" for it and almost relegate such products to the "loser" category before testing even begins.

There are some fundamental problems here. Who gives the tester the right to declare what the perfect product should consist of? Even granting that the tester is a subject matter expert doesn't convey that privilege.

I'll go on record to say what should be obvious to all: There is no product perfect for all users, needs and environments. Period.

It is all about context. Which is better, a wire-speed Gigabit firewall that has little advanced functionality or one that can only offer Fast Ethernet speeds but has integrated antivirus and traffic shaping? The right answer is: It depends. If I'm building a service provider core, the former likely would be better; if I'm trying to manage my company's T-1 WAN connection, the latter would be better.

What's the solution? Any tests of complete products need to be tightly coupled to an appropriate context. At a minimum, the results need to be analyzed with reference to a specific deployment context.

Better yet is for testers to break the products down into their most basic elements. This lets true apples-to-apples comparisons be made between products that don't necessarily implement identical features sets — which is more and more the case today.

The tester's role should not be to make decisions for end users but rather to provide end users the reliable data they need to blend into their own requirements to choose the product that's right for them.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com.

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iSCSI

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is that the performance is what we would get over a Gigabit Ethernet link."

Storage insurance

Robert Filipovich, IT manager for Southern Union Insurance in Alpharetta, Ga., says he had to make the same decisions for his storage data to replace his direct-attached storage — he needed to decide whether Fibre Channel, NAS or iSCSI would be best. He chose iSCSI for the traffic that Microsoft SQL Server and Exchange generate.

"The iSCSI protocol was very inexpensive as well as able to run over my current network," Filipovich says. "It can give us large amounts of storage without having to spend the enormous amounts of money [vendors] charge for Fibre Channel."

Filipovich uses a StoneFly Networks i1500 Storage Concentrator to attach his Nexsan ATABoy 2.2 terabyte storage array to six of his servers. He uses Intel Pro1000 T adapters in his servers.

"Network traffic has grown to such a point that it's cheaper to add Gigabit ports to the network than it is to add Fibre Channel ports. I probably saved 300% easy," he says.

Filipovich's reasons, plus compliance with an IETF standard and scalability, also sit well with Sterling Griffin, IT manager for the University of Alabama Pathology Department in Birmingham — enough to place his network backups on iSCSI.

"The basic reason we started looking at iSCSI or another type of [SAN] was backup," Griffin says.

"Standard software and [hardware] was taking too long to back up. We started looking at our options. They were either a Fibre Channel SAN or iSCSI before it really was a standard. We said, 'Let's try this and see if it works,'" he says.

Griffin has 14 servers that are connected to Advanced Technology Attachment arrays from Promise Technology via Intel Pro1000 T IP Storage adapters and two SANRAD iSCSI V switches.

"We have four more servers on order, which will be added to the iSCSI network," Griffin says. "We won't be using any more local storage for the simple reason that right now I can add more disk space and attach them to the iSCSI switches." ■

The best advice

Early iSCSI adopters have these words of wisdom for customers evaluating the technology:

- **ISCSI needs to be protected just like any other storage data.** If you decide your data needs protection, consider IP Security-enabled gear.
- **Plan for the future.** Purchase a gateway that supports SCSI, Fibre Channel and ATA drives.
- **Consider troubleshooting.** Protocol analyzers with iSCSI support are available from Finisar, i-Tech and others.

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HP, Microsoft developing desktop

■ **BY TOM KRAZIT**

HP and Microsoft are working together on a future desktop reference design that will let users bring several communications technologies together in a package.

The PC is code-named Athens, and the prototype resembles a docked Tablet PC in landscape mode. That display comes with a phone handset and video camera tacked onto its sides, so users can hold videoconferences, take phone calls and handle the rest of their daily Web browsing and e-mail through one desktop, says Byron Sands, director of advanced technology for HP's business PC division. Any portion of a normal PC that relates to the user interface is part of the display screen, including media ports and optical drives.

The rest of the PC, such as the processor and motherboard, fits into a compact chassis that connects to the display via a single cable that delivers data and power to the screen, says Kent Biggs, a senior member of the technical staff for the business PC division. The device uses a wireless keyboard and mouse, he says.

HP and Microsoft are undecided about which wireless technology they will use for Athens, Biggs says.

Because additional wireless technologies might come into vogue by the time Athens is ready in 2004 or later, the companies aren't committing to any one technology. Bluetooth was used in the prototype for the mouse, and the keyboard uses radio frequency technology.

Athens is designed to be a standard desktop in the future, rather than a premium machine, Sands says.

The reference design is the latest specialized version of the PC that Microsoft has helped hardware companies bring to market. The Tablet PC and the Media Center PC were developed in conjunction with specific versions of Microsoft's Windows XP.

Krazit is a correspondent with the IDG News Service's Boston bureau.

IBM

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buy service. With on/off capacity on demand, customers running p690, p670 and p650 systems can activate processors when they need them and turn them off when they don't.

A retailer, for example, could add processing power during the holiday shopping season, but turn processors off — and no longer pay for them — when the shopping rush is over.

"It's really putting meat on the bones of on-demand," says Jim McGaughan, director of IBM eServer product marketing. "We're trying to make sure that we have a strategy that will help customers pay for what they use when they use it."

As for memory, customers can activate memory in 4G-byte increments, as needed. IBM also is offering a 30-day trial at no additional charge for memory and processor capacity upgrades so customers can determine exactly how much additional capacity they need.

That takes the guesswork out of expanding systems to meet spikes in demand, McGaughan says. IBM also is planning to price some of its software, such as its Tivoli and DB2, by the day when temporary capacity is turned on. ■

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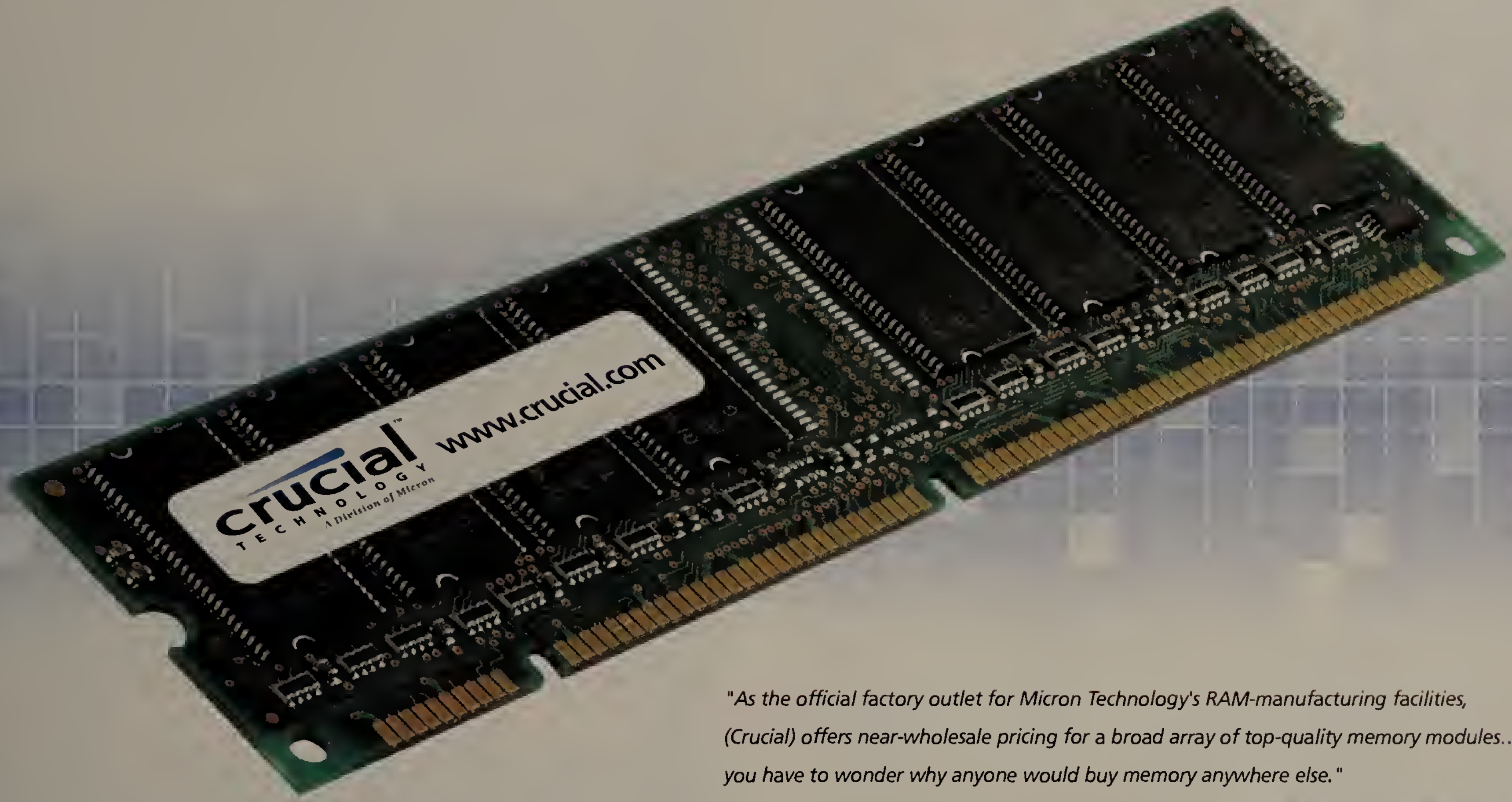

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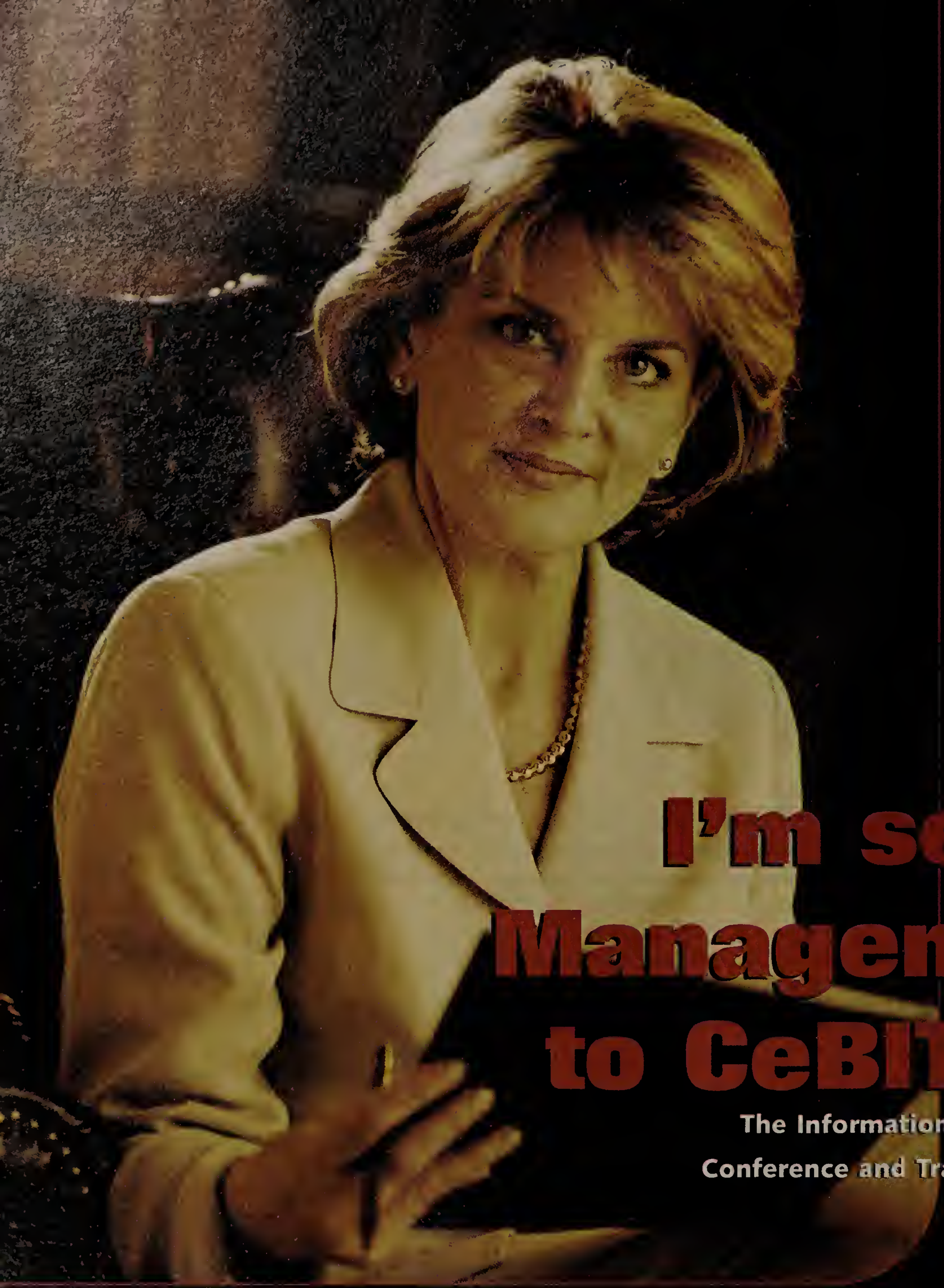

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Short Takes

■ **PeopleSoft** last week unveiled a plan to port its applications to **Linux.** The Pleasanton, Calif., company will deliver Linux versions of all 170 of its software products by year-end, including its ERP, CRM, supply-chain management and human resources applications. IBM's eServer xSeries, DB2 database and WebSphere Application Server will be PeopleSoft's Linux development platform of choice, the companies says.

■ **Network Associates** this week announced the third version of its antivirus management and policy-enforcement console, ePolicy orchestrator, which runs on NT Server or Windows 2003. EPO Version 3.0 doubles the number of antivirus updates it can deliver to desktops and servers with ePO agent software to 50,000. EPO Version 3.0 costs $20 per node, and Network Associates says it will now provide technical services to build in support for third-party antivirus software in addition to the Symantec and Dr. Ahn software packages already supported by ePO.

■ **New Moon Systems** last week announced **Canaveral iQ 2.0,** a new version of its flagship product for managed access to applications running on a server. Canaveral iQ runs on top of Terminal Services, a part of Microsoft's Windows server software packages. Benefits of using Canaveral iQ with Terminal Services include server load balancing and improved manageability, the company says. Canaveral iQ 2.0 can handle more than 5,000 concurrent connections, an improvement over the approximately 1,500 connections supported by Canaveral iQ 1.5 with the preceding version of the product. The new version also lets users set up various levels of administrators to manage user groups or features. Canaveral iQ 2.0 was optimized for use with Microsoft's recently announced Windows Server 2003 but also works with Windows 2000 Server. Canaveral iQ 2.0 will be available this quarter for $179 per user.

Windows 2003: What's next?

■ BY JOHN FONTANA

Microsoft's Windows Server 2003 has barely poked its head out of the box, but users say it's vital to know what's next. That's because the operating system is the gateway to a new generation of products and introduces a new formula for operating system upgrades.

During the launch of the server last month, Microsoft touted the performance and security gains made with Win 2003 and stressed its ability to anchor server consolidation projects.

The other side of the story, however, is that Win 2003 is the foundation for an entire wave of next-generation Microsoft products and feature upgrades that are coupled with the new platform. Without an upgrade, corporations can expect to be in a holding pattern.

Last month, Microsoft dubbed the new operating system and 13 application servers its Windows Server System. Win 2003 is the linchpin for forthcoming products and services, including an advanced file system, collaboration environments, identity management infrastructure, digital rights management and a platformwide self-healing management system. These will be followed by advanced conferencing services based on Microsoft's $200 million acquisition of PlaceWare; support for System Definition Model, an XML-based glue to hold together Microsoft's emerging management platform; and Virtual Server technology that recently went out for its first customer review.

"I do believe that this [operating system] is the springboard for a whole new generation of Microsoft products," says Bob O'Brien, group product manager for Windows server. "It gives us the ability to deliver products that provide a broader platform and one that scales out and up."

In the coming months, new products and features that rely on Win 2003 will include Office 2003, Exchange Server 2003, Real-Time Communications Server, Windows SharePoint Services, Rights Management Services, Automated Deployment Services and System Center management tools.

Microsoft also is playing catch-up with existing products that won't currently run on Win 2003 such as BizTalk Server, Commerce Server and Content Management Server. These and 16 other products have forthcoming service packs that will make them compatible with the new

See Win 2003, page 26

Building an operating system

Microsoft's Windows Server 2003 is ushering in a new era for upgrading the operating system. Microsoft will deliver features on a piecemeal basis instead of waiting for monolithic upgrades. Here is a list of a few of the features and tools that will be available for enhancing and managing the operating system.

Product/feature	Description	Delivery
Real-Time Communications Server	Instant messaging, conferencing server originally slated to be part of the operating system, now is a separate offering.	Mid-summer
Rights Management Services	Controls forwarding, copying, printing, expiration of corporate files, documents.	Fall
Windows SharePoint Services	Can create team workspaces baked into operating system. Couples with Office 2003 and is first step toward new file system.	Summer
Automated Deployment Services	Will allow automatic installation of operating system on PCs that have no operating system, a so-called bare-metal install.	Mid-summer
System Center	First pass at combination of Systems Management Server and Microsoft Operations Manager.	Mid-2004

Managed Objects offers business service mgmt.

■ BY DENISE DUBIE

MCLEAN, VA. — Managed Objects this week is set to announce two software products designed to tell network executives how well end-user applications perform and let them correlate data from disparate, third-party sources, respectively.

The software, Business Experience Manager and Business Data Integrator, are add-ons to the company's flagship Formula business service management (BSM) software. BSM products track the performance and availability of network components that support an application.

BSM products promise to correlate how business services perform based on how well the network infrastructure responds to and supports applications, and to give network executives a heads up when network problems could affect service delivery to internal end users or external customers.

Formula consists of server software that runs on Windows NT, Linux and Unix, and provides reports via a Web-based console. It uses custom software adapters and XML to communicate with other management tools. The most recent packages will offer enterprise network managers a more complete picture of how applications perform across their networks, the company says.

Business Experience Manager will let network managers perform synthetic testing, or simulate one or many end-user transactions to calculate how a network will respond. It also will let network managers capture end-user data at the browser level and track response times for each transaction in a multitransaction

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Saving the music biz?

'NET INSIDER

Scott Bradner

Obviously, I am going to write about Apple's new music-downloading service. As a Mac fan and someone who has been whining for quite a while about the inability of the music industry to reason its way out of a wet Kleenex, how could I not?

With a level of hype that far exceeds its market share, Apple launched an online music service at the end of April. After the launch, the coverage was generally fawning: *Fortune* magazine deserves an award for its cover picture of Apple prez Steve Jobs listening to an iPod stuck in Sheryl Crow's waistband, with a screaming headline claiming that Jobs plans to "save the music biz."

Well, so far, so good. A week later, Apple announced that more than a million songs had been downloaded using the service. (The Apple press release announcing this fact included the obligatory statement from a music company executive who said that he would have considered the service a success if it had sold a million songs in the first month.)

Two dozen of those million were from me (some classic Johnny Cash and the three "exclusive" Bob Dylan tracks). The system worked just as you would expect from Apple, completely intuitive and fast. The system even figured out that I was in Ottawa when I signed up and told me that the service was not available in "your country" yet unless I had a credit card with a U.S. address. The wonders of staying with geographic-based licensing in an Internet world.

A million songs in a week when the system only works on a computer that has less than 3% of the market. This seems to indicate that there just might be a business in this stuff after all. Apple's service is not the only one around, but as far as I have found it's the easiest to use and has the model that makes the most sense. Of course, it might just be that Jobs succeeded in getting the music folks to sign up just because Apple has such a small footprint — less risk that way. And there is some risk. It was only a few days after the service started that instructions were floating around the 'Net on how to rip off the songs after they have been downloaded.

But the point is not that a few people, maybe even a lot of people, will cheat. It is that a whole lot of people seem to be willing to be honest. I don't think honesty is special only to Apple computer users, so I expect the same will be true with Windows users when the service expands to them later this year.

I don't know that Jobs will save the music biz, but he might make that industry think for a few nanoseconds and figure out that suing its best customers for billions of dollars in damages might not be the best business model.

Disclaimer: There might be a class at the B-School covering the business model of suing stones to get blood, but I didn't check; the above business advice is mine alone.

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Win 2003

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operating system, Microsoft says.

While corporations are moving to Win 2003, they see bumps in the road ahead.

"We're not really focused on the future. We are looking now at specific features [of Win 2003]," says Rob Sullivan, vice president of technical operations for Universal Network Exchange (UNX) in New York, which provides electronic trading solutions for institutional investors. Sullivan cites load balancing, the .Net Framework and clustering features in Win 2003 as his immediate needs.

"But we are concerned what this new [operating system] will mean for the future," he says. "What will Exchange look like when they integrate messaging into the core [operating system]? Microsoft is preparing the [operating system] for the rollout of smaller upgrades, and it will affect servers such as SQL and Exchange. We know it will, but we don't know how that will play out."

One major change is that piecemeal upgrades, in addition to their regular patching work, will be the norm instead of monolithic refreshes of the entire operating system.

"To be competitive today, Microsoft has to do feature improvements between revisions of the [operating system] because it takes too long to produce one major revision," says John Enck, an analyst with Gartner. "If those upgrades are for standalone features, that will be OK. But if those new features rely on having other new features installed, then it could get ugly." He says users will have to do regression testing as they begin to add features.

"We don't think customers will embrace all the new features that create upgrades to the infrastructure. Hopefully we will see them being very careful with the features they do embrace," he says.

Microsoft is putting a positive spin on the fact that it can't keep pace with competitors if it plods along in improving its platform, especially in the areas of Web services and distributed computing.

"We know in this new phase that as technology emerges, customers don't want to wait three years to get it," Microsoft's O'Brien says. That three-year cycle is typical for new operating system revisions. Windows 2000 shipped in February 2000, while Win 2003 shipped less than three weeks ago.

"I have mixed feelings about piecemeal upgrades," UNX's Sullivan says. "It's nice to know that you are getting this stuff earlier, but it could be argued that it would boost my [total cost of ownership] now that I have to do Q&A testing, etc. It's now almost a constant source of keeping up."

Others say the idea of incremental upgrades ensures them the latest and greatest technology.

"I'd rather be closer to the bleeding edge than on the tail end," says Tim Seymour, network administrator for the Office of the Surgeon General, U.S. Army. "I don't mind piecemeal. I don't think you have to wait for major releases. The one criticism might be that you are always waiting to get the carrot."

Microsoft has devised three scenarios for delivering upgrades to the platform. The first will be new features that can be downloaded and installed for free. The second will be add-on features that will be part of the company's Licensing 6.0 and Software Assurance package. And third will be products that are separate and run on top of Win 2003.

The second option is important for Microsoft, experts say, because the company needs something in the pipeline to show value in Software Assurance, a maintenance program that amounts to a subscription service to software upgrades.

Without add-ons and interim releases, Microsoft won't have anything to subscribe to until the next major operating system release — code-named Blackcomb — which is not expected until 2007 at the earliest. Microsoft is mulling an incremental upgrade to the server operating system sometime in 2005 with the release of the next version of the client operating system, code-named Longhorn.

The point is users with two- and three-year Software Assurance contracts on the operating system will want to see value in their investments.

Whether incremental upgrades is that value is a question that might be answered in the near future. ■

> **"I'd rather be closer to the bleeding edge than on the tail end. . . . I don't think you have to wait for major releases."**
>
> **Tim Seymour**
> Network administrator, Office of the Surgeon General, U.S. Army

BSM

continued from page 25

application. Business Data Integrator will let network managers define and interrelate business metrics, such as total sales calls or Web site hits, with network element performance. The two new adapters run on top of Formula. An average enterprise implementation of Formula with adapters can cost about $100,000.

Besides Managed Objects, big network and systems management companies such as BMC Software, Computer Associates, HP, IBM Tivoli and Mercury Interactive offer products to track application performance and correlate it directly to predefined business drivers. And while these companies, with their deep pockets and marketing efforts, could help educate enterprise network executives about BSM, the software still cannot be justified in many corporate IT departments.

BSM products still require customers to manually configure the software upon deployment, says Debra Curtis, a research director with Gartner. Because it tracks application performance across multiple network components, BSM also requires that corporate networks have solid configuration and change-management processes in place to accurately track the changes in infrastructure components, Curtis says.

"You have to have a really clear business driver to justify the investment in the software and the cost, time and resources it takes to deploy it," she says.

But Curtis adds that Managed Objects, by offering specific adapters — which are software applications developed to perform specific tasks and feed the data back to Formula — could help enterprise IT departments deploy parts of BSM in a step-by-step process.

"Managed Objects is now offering stepping stones that could encourage people to move toward managing more and more applications in relation to the business," she says. ■

Problem spotters

Service desk statistics show that at least

50%

of alerts are not seen by event management systems, and that it takes an average of six calls from the service desk to identify which IT operation group is responsible for correcting the problem.

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ServiceProviders

■ THE INTERNET ■ EXTRANETS ■ WIRELESS
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■ CARRIER INFRASTRUCTURE DEVELOPMENTS

INCORPORATING
The Edge

AT&T expanding reach of networks

■ **BY DENISE PAPPALARDO**

AT&T says it is expanding the geographic reach of its IP, frame relay and ATM networks ahead of its original schedule.

The carrier is investing $3 billion this year to feed the growth of its data networks, especially overseas, says Mike Jenner, vice president and general manager of global IP network services at AT&T.

AT&T's frame relay and ATM networks will reach 50 countries by year-end, whereas today they span 30. The company says it originally planned to have frame relay and ATM in 40 countries by year-end.

"It's good that AT&T is expanding globally. [The carrier] is at the top of the list for many multinational customers," says Kate Gerwig, an analyst at Current Analysis. "It's important that [AT&T] continues to expand its own network."

Two years ago AT&T's international strategy was based primarily on partnerships and joint ventures, such as its failed Concert initiative with British Telecom. Expanding its own infrastructure might offer users a more stable choice as many international partnerships have fallen by the wayside, Gerwig says.

Although many multinational organizations view AT&T as a top global provider, it still is playing catch-up from a network coverage standpoint. Equant, Infonet and even MCI (formerly WorldCom) reach more countries via their frame relay networks. But AT&T also is investing more in its global infrastructure than most carriers this year.

MCI says its capital expenditures, which include its network investments, will total $1.2 billion on revenue of about $24 billion for 2003. Equant says its capital expenditures will be $300 million on revenue of about $3 billion for the year.

Global availability

Here's a look at how far some of the leading multinational data provider's networks span.

Number of countries where service is available

Vendor	Frame relay	ATM
AT&T	30	30
Equant	130	60
Infonet	70	70
MCI	72	26

AT&T also is expanding the reach of its Multi-protocol Label Switching (MPLS) points of presence around the world. AT&T's IP Enabled Frame Relay and IP VPN services are MPLS-based and are provisioned and supported through the carrier's 850 MPLS POPs in 43 countries.

AT&T says it will add 150 MPLS POPs internationally by year-end. Countries where AT&T plans to build include India, Indonesia, Thailand and Romania.

Although the carrier's MPLS POPs span 43 countries it seems the majority of these nodes reside in the North America, where AT&T has offered MPLS-based services for about four years. These offerings are newer to AT&T's multinational customers.

AT&T would not say how many of its 850 MPLS POPs are outside the U.S.

In addition to expanding its network, AT&T also now supports an unmanaged IP VPN service for its international customers. To date, users outside the U.S. could only subscribe to AT&T's fully managed IP VPN service based on MPLS. Now customers can manage those networks in-house, which offers them more control over their routers while also reducing monthly service fees associated with management.

AT&T also now offers IP VPN customers a VPN Integration Consultant who will help customers design a network, AT&T's Jenner says. More customers are looking for guidance on how best to combine legacy networks with a new IP VPN and also integrate process applications such as CRM, he says.

IP VPN customers can work with one of the consultants for up to eight hours as part of the standard service setup. Customers requiring more assistance will pay extra. ■

Short Takes

■ **SBC** last week launched two managed services in the Boston area. The offerings are **PremierSERV Total IP Communications,** a Cisco-based IP telephony network with associated equipment, system integration, transport, monitoring and maintenance; and **PremierSERV Frame Relay Advantage Packages,** a managed frame relay service including transport, equipment and network maintenance. SBC launched PremierSERV managed service in January to attract midsize businesses looking to outsource network and telecom operations. PremierSERV offerings also include ATM, IP VPN, managed remote-access services, video services, integrated access service and security.

■ Content delivery specialist **Akamai Technologies** and **IBM** have partnered to deliver a service that lets users push out applications to the edge of the Internet. **Akamai EdgeComputing Powered by WebSphere** is the result of a partnership forged last year. The service pushes WebSphere-based applications — and the Java processing that goes with them — to thousands of edge servers within Akamai's content delivery network. Akamai and IBM say the service will let users save on hardware and bandwidth, rather than constantly tapping origin servers.

Lucent, Juniper outline alliance

Arrangement designed to migrate carrier ATM networks to IP.

■ **BY JIM DUFFY**

Lucent and Juniper last week announced a much-anticipated marketing and product development partnership whereby Lucent will sell, service and support Juniper routers for carrier wireline networks.

Lucent announced a similar arrangement with Cisco a few months ago for the mobile wireless market. Lucent disclosed previously that it would line up partnerships to fill the IP/Multi-protocol Label Switching (MPLS) gap in its product portfolio after the cancellation of two key products obtained via acquisition.

Lucent and Juniper say they will offer carriers comprehensive packages designed to migrate service provider networks to IP infrastructures and stimulate delivery of new IP services to corporations. The combined offerings will target a market that is expected to increase from $8.5 billion this year to $12.2 billion in 2005, according to the companies.

The joint offerings include:

- IP VPN: Based on existing products that support VPN services over an IP/MPLS core network.
- Multiservice MPLS Core (expected in the first quarter of 2004): Designed to support ATM/frame relay services while adding IP services onto a converged IP/MPLS core.
- IP Centrex: Lets service providers deliver IP Centrex services to companies over a packet-based network.
- Enhanced DSL: Designed to enable service providers to address mass-market DSL service rollout.
- Optical Edge (under joint development): An offering designed to expand the enterprise market for Ethernet services over existing service provider networks.

Lucent's Worldwide Services unit will provide network design, integration, deployment and maintenance services.

Lucent offers two sources for IP/MPLS — Cisco and Juniper — because Cisco competes directly with Lucent in wireline networks, specifically in ATM switching and metropolitan/long-haul optical, according to Nikos Theodosopoulos, an analyst at UBS Warburg. Nonetheless, as recently as five days ago, top executives at Cisco were pressing Lucent to abandon the deal with Juniper and partner with Cisco for the wireline opportunity.

"We continue to believe Juniper is likely partner although we cannot rule Cisco out completely," Theodosopoulos said in an April 30 bulletin. An April 4 UBS Warburg bulletin said, "Cisco is making a big executive push to turn this decision around in favor of Cisco."

Cisco declined to comment on UBS Warburg's statements. ■

More online!
Get more background on the Lucent-Juniper deal.
DocFinder: 5831

EYE ON THE CARRIERS

Johnna Till Johnson

Worth a look if you're linking remote workers

I've been asked a lot recently about how best to link remote workers in branch or home offices to the networker.

The typical challenge is a company wants to connect dozens or hundreds of remote workers who generally have access to either cable modem or DSL services but aren't within reach of the fiber or cable of a single service provider. One IT executive is looking to provide broadband access to 600 sales executives scattered mostly in home offices. Others want to link large numbers of remote offices (often retail stores).

Several years ago, when broadband was less ubiquitous, the answer was to purchase a dial-up VPN service such as AT&T's. Remote workers today are less happy with the limitations of dialup, which means network executives are often asked to locate, set up, and support dozens or hundreds of broadband remote links, each from a different provider. Can you say nonstarter?

The good news is that some service providers are paying attention to the problem. By lining up relationships with a range of broadband providers that offer the last-mile (and in some cases, long-haul) connectivity, these providers can offer VPN services and 24-7 management and support over their partners' infrastructure. Most importantly, they provide companies with the all-important "one throat to choke" that helps simplify the day-to-day management of remote solutions.

Such providers include Global Linking Solutions, MegaPath and Netifice. While these players are relatively small and obscure, they're beginning to gain real momentum.

For example, Netifice recently was selected by pharmaceutical giant Pfizer to provide connectivity to 10,000 remote workers. MegaPath provides point-of-sale services to Radio Shack's 28,000 in-store workers. Moreover, unlike some of their predecessors, these companies have often kept strong control over their financials, managing to balance growth with profitability. According to MegaPath, for example, Radio Shack's revenue increased by 85% in 2002 and the company expects to hit profitability in fall 2003.

Network executives also should consider another group of players, the more traditional "extranet" providers that operate their own long-haul networks but rely on a range of last-mile providers for broadband access. These include Equant and Infonet, and more recently companies such as Radianz and Savvis Communications, which also offer enhanced services for specific vertical markets. Savvis and Radianz offer financial service extranets; Savvis over its own infrastructure and Radianz across Equant's infrastructure.

In selecting among the providers, network executives should consider geographic reach (local, national, and global if required), financial stability, service and support capabilities, and technical feature/functionality. When it comes to service and support, make sure the provider has a track record of supporting organizations of your size and type. Get references. From a feature-functionality perspective, make sure they're offering the type of VPNs appropriate for your application requirements.

And if you find other providers that help solve this problem, please drop me a line.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

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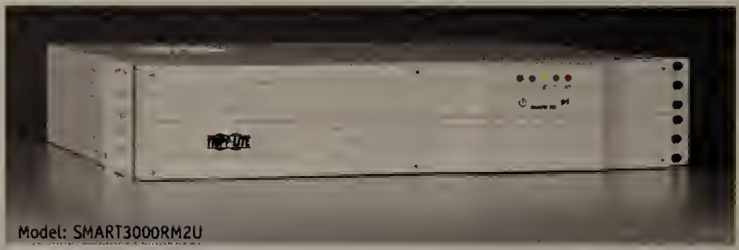

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Special Focus

INTERNET2: Building a faster, safer 'Net.

Internet2 becoming a big net on campus

■ **BY DENISE PAPPALARDO**

Its purpose is not to drive revenue growth, but to find better ways of getting the most out of a very fast IP backbone.

As such, the concept of Internet2 is not new, but the research conducted over its network is far from commonplace.

About 200 universities participate in the Internet2 project, which includes a national backbone called Abilene that's being upgraded to support 10G bit/sec wavelengths.

In addition to beefing up its exclusive network for higher education, Internet2 is working on several projects that could prove useful to public Internet users and to ISPs that support that network, while focused on the higher education community.

The group is expanding network performance monitoring, operating an information-sharing center that's crucial to Abilene's security and stability, and experimenting with Multi-protocol Label Switching (MPLS) to support VPNs.

These are just a few of Internet2's projects, which include developments in software, middleware and network engineering.

All this research and experimentation takes place while the group upgrades its network to 10G.

No 'glut' here

"We view excess bandwidth as a feature of the network, not a waste," says Steve Corbato, director of backbone network infrastructure for Internet2. "We want to stay ahead of demand."

While many service providers involved with the commercial Internet are dealing with what analysts call a "bandwidth glut," the Internet2 members want higher speeds to support bandwidth-intensive application development such as real-time, high-definition television.

The group is deploying Juniper T640 routers throughout the 11 core network nodes that make up the Abilene network. Qwest is supplying additional wavelengths across the U.S. to support the higher speeds. While the majority of the routers are deployed, the whole network upgrade will not be completed until this summer, Corbato says.

Supporting high-bandwidth applications was a motivating factor to upgrade Abilene, but the groups also are looking to migrate to IPv6, he says.

"We wanted to make sure Abilene, as the backbone for U.S. research universities, wasn't an impediment in supporting … native IPv6," he says. Internet2 has been experimenting and deploying IPv6 nearly since network construction got underway in 1997. IPv6 exponentially increases the number of IP addresses a network could support.

Internet2 also is experimenting with larger packet sizes as a way of improving network performance. Large packets improve performance when transmitting "gigabit-per-second flows" because the large packets keep pertinent data together as it travels over the network, Corbato says. The typical IP packet is 15 bytes. A large packet is 9000 bytes, he says.

The network upgrades also have led to the expansion of network performance monitoring, Corbato says.

"We have quadrupled the number of [metrics] we monitor on Abilene," he says.

One of the new metrics is a network validation test. "Servers are set up to send large flows of traffic, on the order of a gigabit," Corbato says. This lets universities use about 10% of their bandwidth to be sure the network is performing as it should before scientists begin application or network experiments.

The group also now has the ability to capture and examine each flow across the network. While the ability to examine traffic closely from all universities has raised security and privacy concerns, Corbato says the group is "very careful with this data. We're looking to see what's happening over the network in real-time, what applications are most popular and the average duration of a data flow."

Essentials on Internet2

A few fast facts on the Internet2 project:

- The educational and experimental network began in 1996.
- 203 universities participate.
- This group spends at least $100 million annually on the project.
- There are 50 corporate members that have invested more than $30 million since 1996.
- Network upgrade to 10G bit/sec is nearly complete.
- The movie "The Matrix" can be downloaded in 30 seconds, according to Internet2's land speed record test.
- It takes 25 hours for the same movie to be downloaded over a DSL.

"We view excess bandwidth as a feature of the network, not a waste."

Steve Corbato
Director of backbone network infrastructure, Internet2

The group also is dedicated to advancing Internet security. In February, Internet2's Research and Education Network Information Sharing Analysis Center (REN-ISAC) joined the Department of Homeland Security's national information sharing and analysis center group.

"REN-ISAC is a higher-education-sponsored center designed to help universities and colleges improve their security," says Mark Bruhn, acting director of REN-ISAC at Indiana University. The program also lets higher education do its part in securing the national cyberinfrastructure, he says.

Indiana University operates REN-ISAC to monitor security threats and events, such as denial-of-service attacks, in real time. The center not only immediately notifies victims and sources, but it also shares this information with other universities to help them better secure their networks.

REN-ISAC, now that it's part of the national ISAC program, can exchange findings with other centers. When the federal government initially formed the national sharing program, higher education was not included, which was a mistake, as far as the Internet2 people were concerned.

"An estimated 15% of the assigned Internet network addresses are held by higher education," Bruhn says. "And, because of what we do and how we approach things with technology, higher education generally experiences security events before other sectors."

Analysis of the information gathered by REN-ISAC and the other centers is expected to lead to the development of detection and defense tools that could be used throughout the Internet, Bruhn says.

He says many of those developments likely will come from the Indiana University Advanced Network Management Lab.

Getting into MPLS

Although REN-ISAC is at the cutting edge of intrusion detection and security, Internet2 just now is testing MPLS.

But that's because the need for the technology is just arising for some Internet2 users. Internet2 recently began MPLS testing primarily because the Internet2 is not looking to marry multiple, legacy networks. The majority of MPLS offerings that businesses are buying from service providers meld together IP with legacy frame relay and ATM networks.

The group started experimenting with MPLS because some Internet2 members were looking to support VPNs over Abilene.

"In our view, MPLS is not a replacement for IP. We are using it as an experimental tool to support secure tunnels," Corbato says. Some Internet2 users want to set up secure tunnels between multiple sites for specific projects or experiments. MPLS seems to be a good fit for these applications.

"One of the other reasons we're looking at MPLS is because it is one of the leading protocols on the table to provision and control lambdas in a dynamic sense," he says. "And more universities are acquiring optical networking assets."

Over the next five years, the industry will need to manage native IP over optical, Corbato says. How those technologies are fully meshed will be critical to how the networks are managed, he says.

Internet2 recognizes that MPLS is an important technology that could help to integrate IP and optical networks, Corbato says.

The group is not interested in arguing whether MPLS is the best technology for telecom providers to manage their networks. Some service providers, such as Sprint, are not using MPLS, while others, such as AT&T, are betting on the technology and using it throughout their data networks.

Instead, Internet2 is focusing on the future of IP networks, as has been its charter since its inception seven years ago. ■

Net.Worker

■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Linksys churns out gear amid buyout

Weeks after Cisco announced acquisition, SOHO network leader continues cooking up innovative products.

■ **BY TONI KISTNER**

MP3 player for cars connects to home networks via 802.11b.

Everyone's got an opinion of what Cisco's announced acquisition of Linksys will mean in the long term. But in these early days before the deal is finalized, Linksys appears to be doing business as usual — innovating like crazy and tackling new markets with unmatched gusto.

At the recent NetWorld+Interop show in Las Vegas, Linksys said it will continue to focus on consumer products and also is expanding its business-class line to include VPN routers and higher-capacity gigabit switches, which it sells through value-added resellers (VAR).

Linksys is scheduled in June to ship the Wireless-B Digital Media Adapter, a device that is expected to stream pictures and MP3 files from a PC to a TV, stereo or entertainment center. The box connects to entertainment devices via RCA connectors, and to networks via 802.11b wireless. Later this year, Linksys hopes to unveil a second-generation device that would stream video. For that, Linksys plans to use faster 802.11g technology and quality-of-service features found in the IEEE's 802.11e specification. 802.11e is required for streaming video, and a draft specification is expected by the summer. The media adapter, which Linksys will position against similar devices from Sony and HP, will cost between $150 and $200.

Linksys says it will begin shipping next month a wireless gaming adapter. The adapter links via RCA connectors to the Microsoft XBox, Sony PS2 and Nintendo GameCube, and to a wired or 802.11g wireless network. The adapter would let the device access the Web so users could play online games from their living rooms without stringing cables to the closest broadband-connected PC. The box will cost $130 to $150. Linksys chose 802.11g technology over 802.11a, saying the cost of an 802.11a version "would be too high for retail."

In July, Linksys says it will introduce the Wireless Music Station, a wireless MP3 player for cars. The device — which the company developed with telematics company Zandiant — sits either in the glove compartment or trunk like a CD changer and connects to home networks via 802.11b wireless. (How the device will be installed in cars is still being worked out.) From a PC, a user could download MP3 files to a "car music" file, then drag and drop the file to your "car" device in Explorer. Linksys says entertainment retailers such as Tower Records can use devices like these to stream promotional music to users devices when they drive within range. The yet-to-be-named player is expected to cost from $150 to $200, depending on hard disk size. Likely, Linksys would offer a version that plays six hours of music, and one that plays 12.

Around September, Linksys is scheduled to debut home automation services offered through broadband service providers and VARs, including a Web security camera that can be accessed remotely. Because the camera is connected to a wired or 802.11g wireless network, users could type the device's IP address from a Web browser to monitor rooms in their home, their doorstep, or wherever they place the camera. Other devices would allow them to control lights, door locks and sprinkler systems. The products use standard technology — X-10, IRDA and sensors. Linksys is building the camera and developing the software user interfaces. The services are in trials now; pricing has not yet been set.

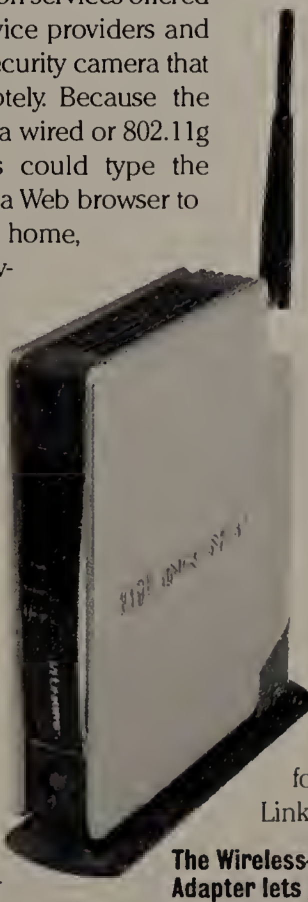
Other less-developed plans include networking over coaxial cabling and voice-over-IP phones. "We might make a version of Cisco's 802.11b phone for [small office/home office] once 802.11e is ready because you need QoS for voice apps," Linksys says. "But if we do, it can't cost more than $199. Any more than that, and the buyer needs a VAR to help guide the purchase."

Linksys also is focusing on what it calls business-class solutions for VARs. These products include managed and gigabit switches, an area where the company sees Dell as its rival. New products will include 16- and 24-port gigabit switches, due out in the fall.

Last fall at Comdex, Linksys introduced a network-attached storage (NAS) device for the VAR market, the EFG80. This summer, Linksys is set to introduce a 120G-byte NAS and a wireless NAS. The Linux-based wireless NAS would come in 802.11a+g or 802.11g versions, with likely capacities of 80G and 120G bytes, the company says. The wireless NAS will be for small companies that need to add storage to a wireless network neatly, as well as consumers who need a media server to store audio and video files. Pricing has not been set.

In June, Linksys is scheduled to begin rolling out several products using Intel's new line of network processors (IXP420, IXP421 and IXP422) geared to small office/home office and small-to-midsize businesses, announced in February. Included is a new wireless access point for mom-and-pop hot spots and small businesses. The access point would offer dual-mode 802.11a and 802.b/g connections, and includes SNMP management and power over Ethernet, which obviates the need for an AC power connection, according to the company. In September, Linksys says it will add a wireless access point/router to the line that includes a VPN.

Also in September, Linksys is scheduled to begin shipping a line of VPN security routers, targeted at small and corporate branch offices. Details and pricing are not set for the eight- and 16-port models, but Linksys says it plans to position them against VPN routers from SonicWall and WatchGuard. ■



The Wireless-B Digital Media Adapter lets you stream pictures from a PC to a TV.

Short Takes

■ At the recent **NetWorld+Interop** show in Las Vegas, **Radvision** announced that its **ViaIP 400** communications platform now fully enables desktop multipoint video, voice and data collaboration over Microsoft's Windows Messenger and Microsoft's upcoming Real-Time Communications Server. ViaIP 400 is a Session Initiation Protocol-based platform that lets three or more Messenger users hold multipoint audio/videoconferences and data collaboration sessions, and lets users of different communication platforms — ISDN, IP and 3G video phones — communicate. Formerly known as Greenwich, Microsoft's RTC Server will be available in the fall. Pricing ranges from $20,000 to $100,000, depending on configuration.

■ **MetaInfo** debuted two IP infrastructure management tools for small and midsize firms. Meta IP SL and Meta DNS are geared to networks with 50 to 500 IP addresses. The products provide features found in Meta IP Enterprise but are simpler to set up, configure and use, the company says.

MetaInfo says the tools help control the dynamic distribution of IP addresses through Wi-Fi networks. Meta IP SL costs $1,700; Meta DNS costs $1,000.

Infuriating error messages
Installed games. Won't boot
Needs partial back-up
restore critical data
Annoying error messages
ctive device driver
System crashed on unsaved document

**Managing desktop reliability can be challenging.
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System integrity compromised
Frequent power outages
Accidentally deleted one file
worked fine yesterday
Everything worked fine yesterday
Accidentally deleted all files
Stuck in DLL Hell
Accidentally deleted one file

Windows XP Professional has an average system uptime that is 10 times better than Windows 98 SE, and 3 times better than Windows NT 4.0, so there are fewer work stoppage incidents. With AutoRecovery, Office XP Professional automatically saves the current document, spreadsheet, or presentation at the time an application stops responding, so users don't lose all their work (and don't call the helpdesk looking for it). Want more reasons to upgrade? Visit **microsoft.com/desktop**

Data based on eTesting Labs Windows XP Reliability Study. Full report available at: http://www.etestinglabs.com/main/reports/[illegible]
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Technology Update

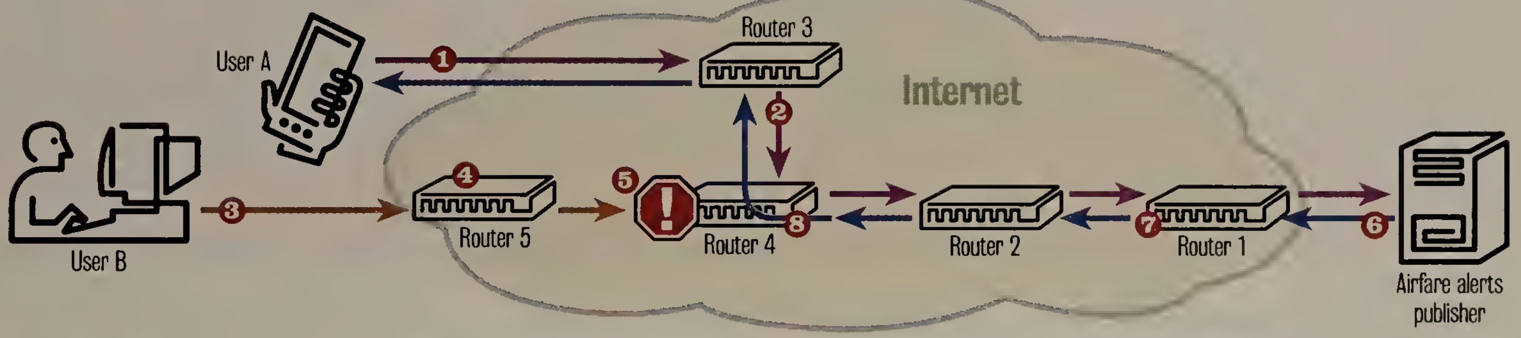
■ AN INSIDE LOOK AT THE
TECHNOLOGIES AND STANDARDS
SHAPING YOUR NETWORK

Real-time delivery gets efficiency boost

■ **BY DAVID ROSENBLUM**

■ HOW IT WORKS **Publish/subscribe**

Subscribers sign up for information delivered by content publishers.



① User A wants to subscribe to alerts of airfares costing less than $300 from Los Angeles to Chicago.

② Router 3 forwards the subscription to the airfare publisher via Routers 4, 2 and 1.

③ User B wants to subscribe to alerts of airfares costing less than $250 from Los Angeles to Chicago.

④ Router 5 propagates the subscription to the publisher via Router 4.

⑤ Router 4 halts the new subscription request because the router already has forwarded the more general request to the publisher.

⑥ Publisher issues an airfare alert of $297 from Los Angeles to Chicago.

⑦ Router 1 detects a match between the alert and information User A requested, so forwards the alert to Router 2 and then to Router 4.

⑧ Router 4 forwards the alert to Router 3 and then on to User A, but doesn't send it to Router 6 because the information isn't what User B needs.

Real-time information delivery plays a key role in a new generation of highly networked Internet applications such as software updates and consumer alert services. However, scalability limitations and the unicast nature of IP protocols have required these applications to use the request/response or polling-based methods of information delivery.

A new technology, Internet-scale publish/subscribe, uses network-based processing to avoid the bandwidth and computational obstacles of traditional request/response communication. This lets publishers of continually changing information selectively reach large numbers of users more efficiently.

Publish/subscribe technology is deployed widely in the financial services field, where commercial publish/subscribe servers are used to relay real-time information such as stock quotes.

In publish/subscribe communication, subscribers sign up for relevant information from producers or publishers, and then the information is delivered to them.

When it comes to delivering real-time information, request/response methods are problematic because they are one-to-one and because users must constantly poll information producers to determine when new information is available. This continual polling wastes compute cycles and network bandwidth.

To scale publish/subscribe to the Internet, vendors have transformed the technology into a networkwide routing schema with its own protocols and routing algorithms.

With publish/subscribe networking, subscriptions provide routing information for efficient message delivery. Just as IP routing uses information about network topology and IP address locality to establish efficient and resilient paths between IP packet senders and receivers, publish/subscribe networking can use information about network topology, location and subscriber interests to establish the best paths.

When deployed as a network-level service, publish/subscribe technology can employ multicast routing to ensure that only one copy of a message traverses any network link. By performing intelligent networking, you can scale publish/subscribe messaging to applications deployed involving millions of publishers and subscribers.

The primary component of a publish/subscribe network is a routing engine, coupled with caching and deferred delivery of published messages for subscribers that go offline. To reduce the amount of message traffic and creation of message paths, the routing algorithm exploits overlaps in subscriber interests.

Consider an application supporting real-time airfare alert publications. Suppose there were two subscribers interested in airfare for the same route — one wanted airfares of less than $250 and the other less than $300. The router that received the subscriptions could merge them and forward the one with fares of less than $300 because the set of notifications matching this would include ones for airfares of less than $250. The router then would direct notifications to the appropriate subscribers.

Publish/subscribe networking is a highly effective and efficient technology for worldwide real-time information delivery. As the demand for affordable Internetwide real-time information delivery increases, expect to see more deployments of the technology in intranets, in content delivery networks and ultimately in ISP networks.

Rosenblum is CTO of PreCache. He can be reached at drosenblum@precache.com.

Ask Dr. Internet

By Steve Blass

Where can I find information on MS-CHAP Versions 1 and 2? I'm looking for details on the authentication mechanism used, why it might be better than CHAP and what extensions there might be.

The Windows 2000 Security Little Black Book by Ian McLean says MS-CHAP provides more security than CHAP "because it allows the server to store hashed passwords rather than clear-text passwords." MS-CHAP is described in RFC documents at www.ietf.org/rfc.html. RFCs describe the protocols in great detail. Newer documents have larger numbers and may make earlier RFCs obsolete.

RFC 2433 defines the packet-level protocol differences between MS-CHAP and CHAP (the primary differences are in the format of the Response packets). CHAP is defined in RFC 1994. Version 2 of MS-CHAP (used in Windows 2000) is defined in RFC 2759, which says that Version 2 is "similar to, but incompatible with MS-CHAP" and explains why. The most recent mention of MS-CHAP we found was in RFC 3079, on Deriving Keys for use with Microsoft Point-to-Point Encryption.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark Gibbs

Reach for the remote

This week we wanted to look at a server-automation package, but as we started to work with it we quickly decided the computer room was way too hot and claustrophobic. Obviously, remote access would be better than sweating. Now a few months ago we discussed a system called VNC that operates rather like pcAnywhere but is free. Well, as good as VNC is, its response time is a little slow for extended use.

Here at the secret subterranean Gearhead laboratories, we get a fair amount of products to test, and the problem is we only can get through a limited amount in the time we have available. So stuff sometimes gets shelved for far longer than we'd like. We often think "such-and-such would be really cool to fool with ... er, test," but time slips away and suddenly we're feeling guilty. (Public relations people, please note that we only feel a little guilty.)

Anyway, a product we've had around for far too long turned out to be the answer to avoiding our computer-room sauna. The product is IP Reach M-Series from Raritan Computer, the latest version of the company's hardware-based remote access tool.

IP Reach is a hardware-accelerated and highly manageable alternative to remote-access software packages such as VNC and pcAnywhere. The device connects the keyboard, video and mouse of up to four PCs or KVM switches (the number of ports depends on the model) and one serial port to a remote PC using Secure Sockets Layer over IP on a LAN, WAN, Internet or dial-up connection.

The product can be used to access Wintel- or Sun-based devices. In fact, because IP Reach is handling raw KVM connections, you even can access BIOS and boot-up services. Combine this with remote power management and you have complete control of all modes of PC operation.

If you use IP Reach to access a KVM switch, you can gain control over every server to which the switch is attached. IP Reach ports can be assigned as private, shareable only by administrators or shared by any authorized user. Moreover, the ports can be accessed independently — that is, remote users can access separate ports.

Users can be restricted to Web access and/or modem and serial console access, and allowed to have full control of the mouse and keyboard or see only screen updates. Users also can be restricted so that they can connect only from a specific range of IP addresses.

Handling keyboard and mouse traffic is a relatively straightforward process that IP Reach handles as well as any other remote access system — this service requires a relatively low data rate.

Where things start to get difficult is video — trying to transfer screen data for graphical user interface-based operating systems requires lots of bandwidth. The IP Reach hardware includes a high-speed frame-grabber that digitizes and compresses the video. Over a LAN or other high-speed link this essentially provides a real-time response for remote-access clients.

The IP Reach compression subsystem also is smart enough to modify the color depth and compression to optimize the data rate for the bandwidth of the delivery medium.

Installation is simple. You attach a monitor and keyboard to the Admin Console connections, fire up IP Reach and work through the configuration menus or use the configuration wizard. You also can directly connect to IP Reach from a PC using a crossover Ethernet cable and a Web browser.

You can assign IP Reach a static IP address or tell it to use DHCP. You can set up user accounts on IP Reach or configure it to authenticate using a RADIUS server.

The remote client software called Raritan Remote Client (RRC) is an ActiveX component that is downloaded from IP Reach over HTTP. Once installed, RRC switches to HTTPS, asks you to authenticate and then lets you see all the Raritan devices on the local network. Then you can make a connection to a specific IP Reach port (KVM or serial) or to the administration interface.

The RRC can autosense video settings and calibrate color rendition. There's also support for keyboard macros. You can connect simultaneously to as many IP Reach ports as you please, and each port connection can be saved as a profile.

The M-Series IP Reach system costs $2,800 for the two-port model and $3,800 for the four-port version.

Being hardware-based, the IP Reach system costs a lot more than a software-only solution, but the upside is raw performance. On a LAN, IP Reach is the next-best thing to being directly connected!

Access Gearhead remotely at gearhead@gibbs.com.

CoolTools

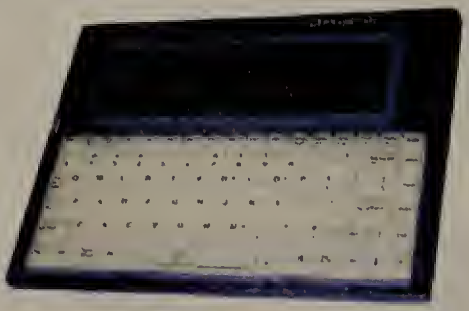
Quick takes on high-tech toys

By Keith Shaw

Will this replace your laptop?

QuickPAD Technology recently launched its laptop alternative — the QuickPAD Pro Mail. The 2-pound device costs $400 and features "all the conveniences of a notebook," the company says.

The QuickPAD Pro Mail includes a built-in word processor, spell checker, spreadsheet, scientific graphing calculator, database and personal information manager. The company says the device can hold up to 600 pages of content, and includes a slot for external Flash memory cards up to 128M bytes. Data can be transferred to a PC or Macintosh via USB port, RS-232 or IR receiver. The device runs on four AA batteries (rechargeable batteries are optional) that provide up to 100 hours of life.



The QuickPAD Pro Mail includes a built-in word processor.

SMC bundles 802.11g with a cable modem

SMC Networks last week announced its SMC8013WG Wireless Cable Modem Router, which combines 802.11g (prestandard) wireless LAN technology with a cable modem. SMC says it plans to market the device to cable service operators to give or sell to customers as a way to upgrade to broadband connectivity. The device will cost about $120 and is scheduled to be available to cable service operators in June.

In addition to the prestandard 802.11g wireless router, the 8013WG includes a four-port Ethernet switch. The device includes SMC's EZ Installation Wizard for three-click setup, which aims to help reduce installation service calls, SMC says. The SMC8013WG has DOCSIS 1.1 certification, and can be upgraded through software to the DOCSIS 2.0 and CableHome 1.0/1.1 standards. The device also includes a stateful packet inspection firewall, content filtering and virus-protection features.

BenQ releases monitor that also displays photos

BenQ last week announced an LCD monitor that includes a built-in digital photo frame and SRS surround sound system. The 15-inch FP591 monitor can connect to an optional TV tuner that supports National Television Standard Committee and Phase Alternating Line systems, and composite, S-video and TV antenna signals without an external power supply.

The monitor has a 16-millisec signal response time and a 450:1 contrast ratio. The standard resolution is 1,024 by 768 pixels (16.7 million colors), and the monitor can detect analog and digital signals, BenQ says. The digital photo frame feature lets users directly view pictures taken with a digital camera without connecting via a computer or separate memory card reader. Users can slide in a Compact Flash, Secure Digital/ MultiMedia Card or SmartMedia Card to view photos. The FP591 is available now for $450.

Shaw can be reached at kshaw@nww.com.

BenQ's new FP591 can run a slide show of digital camera images without connecting to a PC.

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opinions!

EDITORIAL

John Gallant

Security firms accept debate challenge

Last month, I invited four of the leading security hardware suppliers to a debate at the upcoming CeBIT America conference, and I'm pleased to report that all of them accepted the challenge.

On June 18 in New York City, *Network World* Senior Editor and security expert Ellen Messmer will join me on stage to grill Cisco, Network Associates, Nokia and Symantec in the first portion of the Network World Security Showdown — an unscripted, presidential-style debate. (For more information on this first CeBIT America event, go to www.cebit-america.com.)

Messmer and I will ask these four vendors about the strengths and weaknesses of their security offerings — from firewall to intrusion prevention — and their strategies for helping customers lock down networks.

Once we're through with our questions, we'll sit back and watch as the vendors grill each other in what's usually the most provocative portion of these Showdowns. (We've done nearly two dozen of these debates on a range of technology topics.) After the vendors have a go at one other, audience members can pose their own questions.

Our speaker lineup is superb. Cisco is sending Jeff Platon, senior director of product and technology marketing for security. From Network Associates, we'll have Christopher Bolin, senior vice president of product development, and from Nokia, we've got Dan MacDonald, vice president, Nokia Internet Communications. Symantec has committed Charlie Johnson, vice president of Symantec Security Services.

These top executives will have to think on their feet and be prepared to answer unscripted questions from their rivals and us — questions designed to show the real differences in their product portfolios and strategic direction.

In the editorial challenging the companies to participate, Messmer and I said we'd consider adding a fifth company to the lineup, a kind of wild card to shake up the mix. After reviewing recent developments, we've decided to challenge Sun to join us up on stage. Sun is involved in a number of development initiatives and partnerships aimed at positioning Sun's hardware as security appliances. We'll let you know how Sun responds to the challenge.

For now, send me your thoughts and questions for the Security Showdown. We'll make sure the vendors address your concerns.

To Symantec, Nokia, Network Associates and Cisco: Thanks for taking the challenge.

To Sun: Are you up to it?

— John Gallant
Editorial director
jgallant@nww.com

Need for speed

Regarding your Face-off on whether the enterprise is ready for end-to-end wireless LANs (www.nwfusion.com, DocFinder: 5827): All the discussions regarding deployment of WLANs in the enterprise seem to focus on the issues of security and management headaches. What about the more fundamental issue that no one addresses — speed?

Why would I want to give up my dedicated, 100M bit/sec, full duplex switched connection to have a shared 55M bit/sec connection? Is that not going backward a generation in speed? Deployment in the home to share a broadband connection, I understand. As a complete replacement for the wired network in the enterprise, I don't.

Mike Palombo
McMurray, Pa.

Balanced coverage

In the story "VoIP variations" (DocFinder: 5828), I was surprised to see so little coverage of 3Com's NBX product line and so much coverage (comparatively) of Cisco and Shoreline. The story gives the impression that 3Com's NBX has a small market share, and that it isn't as advanced as other systems.

3Com is shipping a switch that combines data and power (802.3af) and has built-in voice prioritization. Not to mention that 3Com's Ethernet Power Source has been shipping for years, and that all NBX phones will be compatible with either power source. The story mentions that Cisco "has indicated it plans to support 802.3af" but omits that 3Com is already shipping it in a switch that combines voice, data and prioritization at a much lower price than Cisco's data-only switch.

Your readers would be better served if you had a more balanced approach to coverage of vendors in the IP PBX marketplace.

Don Gulling
President
Verteks Consulting
Ocala, Fla.

Combined approach

In his Backspin column "Restrategizing support" (DocFinder: 5829), Mark Gibbs focuses mainly on the lockdown method of desktop control without elaborating on the costs associated with this type of policy or the administrative headaches. My company has conquered the desktop-support beast by using a combination of lockdown and the "anything goes" approach.

Anything goes says that users log on to the local PC with full administrator rights (Windows 2000), although the network logon is restricted based on group membership. Because we are a CPA firm, we update software during tax season constantly utilizing Novell's Zenworks. We no longer have to fight the battles associated with updated software not running on a locked-down PC.

Lockdown says that users are given a "perfect workstation" containing all firm applications, standard network settings and custom modifications to the operating system. This "perfect image" is updated continually on the network and distributed to new PCs via Zenworks Imaging and PXE services. All users are required to sign off on an "approved software" list. More software must be licensed. Users are instructed how to save all data to the network. If the user has a problem with his PC, IT is only responsible for restoring the "perfect image" from the network.

Chris Meyers
ISC manager
James Moore & Co.
Gainesville, Fla.

E-mail letters to jdix@nww.com or send them to John Dix, Editor In Chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! **www.nwfusion.com** Find out what readers are saying about these and other topics. **DocFinder: 5826**

"Here's how consumers can distinguish between legitimate bulk e-mail and annoying spam..."

STAYING CONNECTED

Edward Horrell

From geek-speak to execu-speak

I am a strategic telecom consultant, meaning I am usually hired by senior management to manage and direct projects. I work with IT departments a lot and frequently sit in on IT presentations to senior management.

I have seen "the look" often.

The look comes from nontechnical senior management when geek-speak and three-letter acronyms start flying. It's a glazed type of look, similar to a deer staring into headlights.

Our industry seems to have acronyms for everything. Those of us who are on the technical side of things incorporate these acronyms into our everyday speech. This is OK when talking to our peers, but it can be disastrous outside our departments. Let me give you a couple of examples.

I work closely with the executives of a technology company in the South. The CTO of the firm is called on often to give reports to senior officials. He is sharp, personable and does his job well. However, he uses geek-speak during his presentations, assuming everyone understands what he is saying. Meanwhile, the look is flying around the room.

This man was recently passed over for a promotion to an executive position for which he was well-qualified. The reason given by the other senior executives: "We don't understand half of what he says!"

Then there's Ken Glass. He had been a member of an outside accounting firm used by First Tennessee Bank. A complete shakeup of what was then called the "data processing function" led to Ken being named head of bank operations, which was primarily data processing. He had programmers, analysts, techies, system designers, data processing officers, telecom officers (me) and other technocrats reporting to him.

The acronyms flew around like dirty words at a rap concert. But Ken would pause and say, "Would you explain that to me?" He didn't sound dumb or uninformed at all; he was simply getting a grasp on things so he could explain them to other executives. After I was hired at the bank, I was asked to give a report to the president about what my new department would be doing. I got the look, and Ken helped by showing me how to use phrases such as "impact on earnings per share" with executives. He's now president of that First Tennessee Bank.

Here are a few tips on avoiding the look and converting geek-speak into execu-speak:

- Forget the acronyms; explain things in plain English.
- Don't assume everyone knows what you're talking about. In a non-condescending tone, ask what the level of knowledge is about the subject at hand.
- Encourage questions, and answer them.
- Draw simple pictures and speak of benefits to the company as a whole, not your department or "the technology."
- Speak often of effects on profits.

By following these steps, you'll soon see those looks of confusion turn quickly into looks of comprehension.

Horrell is a telecom speaker, author and consultant in Memphis, Tenn. He can be reached at edwardhorrell@mindspring.com or via his Web site, www.edhorrell.com.

Forget the acronyms; explain things in plain English.

ON SECURITY

Winn Schwartau

Plugging corporate data leaks

Have you ever forwarded an e-mail to someone, then realized you left in original comments that the recipient wasn't supposed to see? Or maybe you accidentally forwarded a private company memo to a journalist or client? Company information should be guarded at all times, and accidentally sending private information can be just as bad as doing it on purpose.

When you look inside any enterprise network, the disparity of information and the varying degrees of data classification sensitivity is dizzying. Is privacy-related human resources information more sensitive than product plans? Are customer lists more valuable than litigation preparation documents? Should all data be handled the same, or do some areas receive much more attention to security?

You can use antivirus software to contain data leaks abetted by Back Orifice or other remote administration tools. But "password recovery tool" is a mere product classification euphemism for "commercially sold password-cracking tool." Sure, such tools have legitimate uses in a corporation, but do you really want the majority of your office staff password-cracking from their desks?

Thousands of subclasses of software present a danger to any company that cares about plugging its private information leakage. Products such as Pest Patrol (www.pestpatrol.com) and OptOut (www.nwfusion.com, DocFinder: 5822) can help you uncover remotely installed spyware and steganography, in which information is hidden in seemingly innocuous files and documents.

We all receive Word and Excel documents. The first rule in opening any attachment is to make sure it has been thoroughly scanned for viruses. But when you are sending someone a .DOC file, what exactly are you sending him? You would like to think that the contents of the file are all you are sending — but how wrong you are.

Unbeknownst to you, Microsoft adds information, called metadata, to every .DOC file you create. Worse yet, this information is invisible to you, unless you have the right tools to recover and examine it.

Metadata is much more than tracked changes or comments intentionally left in a document for group sharing. Microsoft metadata includes the last 10 authors of a document; full name and path of the location where the document is stored; white font information; amount of time spent editing the document; file properties; residual fast-save information; hyperlinks; smart tags; embedded text or graphic objects; and more. E-mailed documents might include embedded header information (sender name, e-mail address and subject). Even deleted text you thought was long gone can reappear, which can lead to an embarrassing or damaging situation.

I found an amazing array of edits and document-handling records in a recent story that my editor and I iterated. Try this: In Word, go to File, select Open, then in the "Files of type" drop-down list, select "Recover text from any file" and click Open. The document will open without the native .DOC formatting. Take a look at the end of the document. Voilà! Hidden secret metadata magically appears.

So what can we do about this security and confidentiality breach?

Many people are under the impression that converting a .DOC file to an .RTF file format will hide much of the Microsoft-collected information, but this is simply not the case, as shown by metadata recovery tools. However, when I converted my .DOC file to .txt, all of the offending information was swept away. This is not a practical solution for most business applications, because we like our .DOC files to be pretty and nicely formatted.

Now the tough question: How much private and confidential metadata do you want to send to friends, colleagues, partners, lawyers, journalists, clients and so on? Once you answer that question, have your techies look at a few of the products that will solve this problem, such as iScrub (DocFinder: 5823), Metadata Assistant (DocFinder: 5824) and Workshare Metawall (DocFinder: 5825).

First, you have to be aware. Then, you have to care. Only then can you do something. It's your turn.

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Thousands of subclasses of software present a danger to any company that cares about plugging its private information leakage.

NetworkWorld Review

802.11g WLAN gear

D-Link, Belkin top our early wireless tests

■ BY TOM HENDERSON, NETWORK WORLD GLOBAL TEST ALLIANCE

The lack of a final standard hasn't prevented an early crop of 802.11g wireless LAN products (54M bit/sec, 2.4-GHz frequency) from coming to market. We obtained seven prestandard access points and put them through their paces. This gear is pointed largely toward home and small business markets, and the product features show it. This first group is far faster than pure 802.11b, yet slows quite a bit when 802.11b clients try to access them. They show promise, but our results will change when a final standard brings compliant firmware upgrades.

We tested products from Apple, Belkin, Buffalo Technology, D-Link Systems, Linksys, Netgear and SMC Networks. Buffalo's products hit our doors first — and, like many of the participants, the company followed up with several CDs or fat firmware files worth of revisions in the three months after products were released.

The D-Link DI-624 and Belkin's 54g products win our Blue Ribbon Award — Belkin's installation, management and performance were very good, and in terms of raw performance, D-Link's DI-624 was positively blazing — outdistancing the competition.

But are any of these products ready for production deployment? The answer is mixed. With the 802.11g specification still in draft form — it's unlikely that any of the products reviewed will have the same firmware after the final specification is agreed upon this summer. All these products are upgradeable, but it's difficult to tell how the changes will affect performance. At the time we conducted our test, the products lacked support for the upcoming Wi-Fi Protected Access specification (see "Securing 802.11g," page 46), so high security is up to third-party authentication schemes.

Speed and range

Because 802.11g uses the same radio spectrum as 802.11b and also provides optional backward-compatibility with 802.11b, 802.11g is perceived as the successor to 802.11b (See "The 'Frankenstein' spec," page 46).

The draft specification provides for speeds up to 54M bit/sec, but in testing we found on average about 14.97M bit/sec of speeds. The difference between the gross speed and our average results is similar to the differences seen in 802.11a and 802.11b products — signaling overhead eats up a large fraction of performance (roughly more than one-third off the top). The data rates with 802.11g can be blazing compared with 802.11b. D-Link turned in the best optimized speed, with a 24.73M bit/sec rate.

But these speeds often are compromised if an 802.11g access point is in dual-mode 802.11b/g — because the access point will fall back to the slower data rates if there's an active association with any 802.11b device. Some access points were more sensitive to fallback data rates and might be perceived as slower as a result. For optimum results (and for the basis of grading performance), we used the products' pure 802.11g modes where available.

When an 802.11b client was used (various 802.11b-only cards) in close proximity to the access point, data rates would drop back to 802.11b levels. Mixed mode performance drops are typical and part of the draft standard. This effect likely will continue to change until stabilized under the final standard when it is agreed on in the early summer. Because of the expected changes that will take place in the standard, speeds are likely to change when subsequent firmware arrives for each access point.

See 802.11g, page 44

■ Net Results

4.25 RATING

AirPlus Xtreme G DI-624 4-Port Wireless Router

Company: D-Link Systems, www.dlink.com **Price:** $150. **Pros:** Fastest tested. **Cons:** Lacks greater security features.

4.25 RATING

54g Wireless Cable/DSL Gateway Router

Company: Belkin, www.belkin.com **Price:** $168. **Pro:** Best setup/installation/management. **Con:** Only average speed.

4.0 RATING

WRT54G Wireless-G Broadband Router

Company: Linksys, www.linksys.com **Price:** $150. **Pro:** Second fastest. **Con:** Average features.

3.75 RATING

Barricade g Wireless Cable/DSL Broadband Router (SMC2804WBR)

Company: SMC Networks, www.smc.com **Price:** $150. **Pro:** Full-featured access point. **Con:** Somewhat slower; weaker management user interface.

3.5 RATING

WG602 Wireless Access Point

Company: Netgear, www.netgear.com **Price:** $150. **Pros:** Easy setup; good speed. **Con:** Minimal features.

3.25 RATING

WBR-B11/G54 AirStation Broadband Router Access Point

Company: Buffalo Technology, www.buffalotech.com **Price:** $200. **Pro:** Many features. **Con:** Occasionally tougher management.

3.25 RATING

AirPort Extreme Base Station with modem

Company: Apple, www.apple.com **Price:** $250 with modem, $200 without modem. **Pro:** Easily supports RADIUS. **Cons:** No browser user interface; one port.

What's the score?

	D-Link BLUE RIBBON WINNER	Belkin BLUE RIBBON WINNER	Linksys	SMC	Netgear	Buffalo	Apple
Speed 25%	5	3	4	3	4	4	4
Features 25%	4	4	3	5	3	3	3
Management 25%	4	5	4	3	3	3	4
Installation 25%	4	5	5	4	4	3	2
TOTAL SCORE	4.25	4.25	4.0	3.75	3.5	3.25	3.25

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

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802.11g

Continued from page 42

Geographic coverage was fairly uniform across the products when set in the strict 802.11g mode (where possible). D-Link's DI-624 had the largest range (344 feet), and Buffalo's gear had the smallest radio range (about 213 feet) before signals degraded to uselessness. In 802.11b/g mode, the range for all of the access points was smaller — on average about 279 feet. There was not much of a range difference between 802.11b and 802.11g modes, although our speed fell back slower in the pure 802.11g modes as we moved away from the access point.

D-Link Xtreme G DI-624

D-Link's Xtreme G is an access point and four-port router that can be set up from a browser interface or CD. There is a choice of a setup wizard for non-techie and another method with advanced settings. Xtreme G had the fastest throughput of the access points we tested — on average about 24.73M bit/sec, with a peak of 26M bit/sec (albeit with a Buffalo client card).

Security isn't strong on the list of features, although it includes Wired Equivalent Privacy (WEP) (64- and 128-bit encryption); filtration of users by media access control or IP address; port blocking; time-of-day access by MAC or IP address; and URL and domain blocking. A rudimentary "firewall" also can be used to create admit/deny rules based on traffic behavior but falls short of stateful packet inspection and preset rules-based firewall applications.

Xtreme G had the largest usable radial air space range of all the access points tested in pure 802.11g mode, but it wasn't the fastest in the 802.11b/g mixed mode measured with 802.11b clients. However, this access point had strong raw speed and range — both strongly desirable characteristics.

Belkin 54g

We were dazzled by Belkin's installation applications for its 54g access point. The CD-based application had almost no options, except for the checkbox to agree to the license agreement. More setup options are available via the browser access to the hardware. The 54g is a four-port router and access point, and the installation application figured out the network infrastructure of our labs, found the router, grabbed a Dynamic Host Configuration Protocol (DHCP) address for it, invoked network address translation (NAT) and woke up the access point in ready-to-run mode. The only downside is its browser interface has no default password or user name. Otherwise, it was the easiest setup for a non-techie or network installer that we've ever found in an access point. The browser interface that the Belkin 54g uses is an equal to the CD-based setup program.

Configuring the access point was easy — features include a firewall and "parental control" functionality. Two modes are available — simple access point, or access point/router. We did all our tests in the access point/router mode. The device also can be managed remotely via a single-stated remote IP address via its WAN port. This was potentially handy, but the weak security of the device (it requires only a password) could make it vulnerable to a dictionary attack, where various words are progressively substituted until the password is cracked.

We were pleasantly surprised to find that the access point could search automatically for updates to be presented for use after the next access point browser interface logon. This feature was unique among the access points tested, and given the pace of firmware updates, this feature is highly desirable.

The device's throughput performance was average (see graphic, below), and it showed a linear decrease in speed over distance in our walkabout testing.

Linksys WRT54G

The Linksys WRT54G access point and four-port switch/router uses a CD-based wizard for setup, and also can be set up via a Web browser. The wizard was good at guessing the network infrastructure of our lab, but wasn't quite equal to Belkin's wizard. However, users are unlikely to hurt themselves with this.

The WRT54G doesn't contain any strong firewall features. Security consists of WEP, MAC-layer access control lists, filtered ports, time-of-day access by MAC, and VPN passthrough support for Point-to-Point Tunneling Protocol and IP Security-based LANs.

The device came in second for its performance, and the performance was consistent across all our tests — in mixed mode (802.11b/g), the access point had the fastest performance.

SMC2804WBR

SMC crammed bridge, routing and firewall applications into its SMC2804WBR access point and four-port router. It is compatible with Windows and Apple 802.11b/g networks. The 2804, also known as the Barricade g, can be set up via wizard (civilians) or with Advanced Setup. The CD wizard application flashed SMC products as advertisements, reminding us of our distaste for commercials before the movie starts.

The advanced setup includes options for system control functions, WAN/LAN setup, wireless configuration (Service Set Identifier and choice of pure 802.11g or 802.11b/g mixed mode). The 2804's twin antennas are removable, and can be replaced with other wireless LAN antennas designed for 802.11b gear.

The firewall control uses a combination of access controls, coupled to a stateful inspection. Various combinations of features also can be enabled to increase security via a user-defined filter table, MAC filtering (admittance), specific user-defined URL blocking, scheduled access and intrusion detection (blocking). The

See 802.11g, page 46

Securing 802.11g

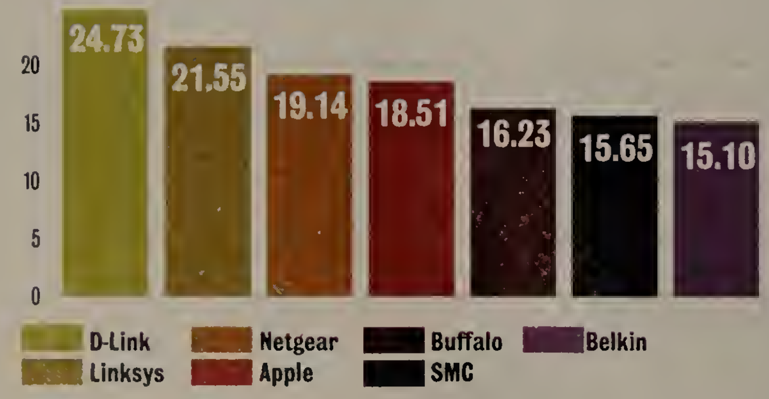
The products we saw only had Wired Equivalent Privacy protection, except for Apple's AirPort Extreme, which includes support for Remote Authentication Dial-In User Service authentication. None of the 802.11g access points we tested had provisions for Wi-Fi Protected Access, the soon-to-be-released security technology designed as a bridge between WEP and the 802.11i standard. Any number of applications can crack WEP, and while it was initially used for wireless LAN authentication, it's no better than a closed door. WEP is essentially worthless.

WPA uses at minimum the addition of a master access point password phrase (to be used at the client for successful access point association) and Temporal Key Integrity Protocol. WPA optionally also connects clients via the Extensible Authentication Protocol to an authenticator via 802.1X. The authenticator can be a RADIUS server or other components of a network key authentication infrastructure — Apple's AirPort Extreme was the only access point that could require RADIUS authentication.

— Tom Henderson

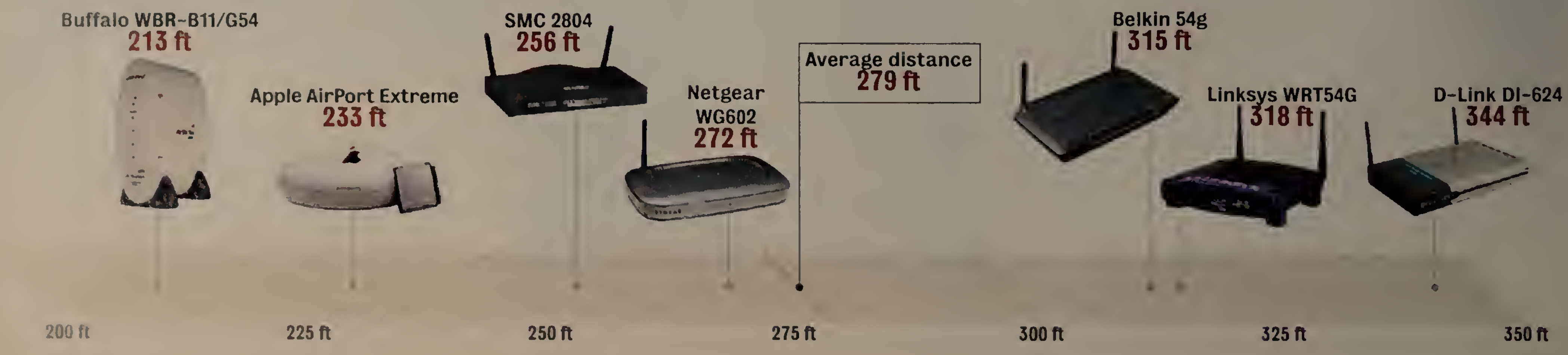
Performance

802.11g throughput test speed average, in M bit/sec. Measurements taken with one client card, at 9 feet and 65 feet away from the access point.



Range

Distance between client and access point for "fall off," using a batch loop FTP, measured from rear of access point to the client drop off point in a straight, unobstructed line. Pure 802.11g mode or 802.11 maximum mode was chosen.



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802.11g

continued from page 44

default settings were adequate for most small office/home office (SOHO) users. The browser interface makes poor use of screen dimensions, which made log viewing difficult.

The performance of the SMC was linear in our walkabout test and, like other units tested, fell back to 802.11b speeds when an 802.11b device was associated with it. In the pure 802.11g mode, performance was near average.

Netgear WG602

Simplicity sometimes can mean bliss — the WG602 is a simple, no-frills access point without SOHO features. The setup was one of the simplest of all the units tested, if only because there aren't many features and options to choose. WEP is supported, both 64- and 128-bit.

Like other Netgear access points, the WG602 is accessed via a browser interface. Because this isn't a SOHO product, setup is focused more on network personnel. We couldn't find a way to force the WG602 into a strict 802.11g mode, although when 802.11b clients were around we didn't find the bandwidth cannibalization normally found.

We thought that the Netgear 802.11a/b/g adapter card would run most quickly with the WG602, but oddly it was the SMC wireless LAN card that performed best with it. WG602 also had linear performance in our walkabout test, and was an above average performer in the mixed 802.11b/g mode (again, we couldn't be sure that there was a pure 802.11g mode).

Buffalo WBR-B11/G54

The Buffalo AirStation was the first 802.11g device we received, and we had three revisions of the firmware in three months of testing. The AirStation can be configured through a bundled CD. After installing the utilities, wireless LAN adapter and/or manuals, the device can be configured via browser.

AirStation is a hybrid access point/gateway/router/switch, which left choices similar to SMC's access point initially — for DSL, cable or an "advanced" setup. The DSL and cable selections worked well for civilians, and the advanced setup can be used to move the default IP address to another. But this time, the new address is kept as a link on the page, so that when the access point reboots, the new IP address of the access point can be selected easily. We liked this thoughtfulness because other browser-based applications aren't that smart. Another handy feature is the autosensing WAN port, which can be connected to a router or hub port — it figures out the difference and adjusts within 3 seconds to the correct electrical wiring needed.

AirStation had nonlinear fallback performance in our walkabout test as it would leap back and forth in speed trying to adjust to increase/decrease signal, and we lost association in 802.11b and 802.11g modes after about 98 feet. An external antenna jack is provided for adding an antenna, but we did not test this feature. The overall performance in both modes was average.

Apple AirPort Extreme AP

AirPort Extreme must be configured from an Apple computer and has no browser interface. We updated the resident AirPort administration software on a PowerBook G4 running OS/X 10.2 from the enclosed CD. AirPort Extreme is a one-port gateway/router; the Administration software found the AirPort Extreme and configured it correctly for the network that we had connected its WAN port to.

We found some subtle limitations. AirPort Extreme limits its DHCP NAT range to a 10 address range — outside of the range we use in our labs. DHCP can be configured to proxy the DHCP connections otherwise. There is no firewall application, although the AirPort Extreme has MAC address filtering available.

AirPort Extreme also contained an optional modem that can dial in to an ISP to effect an Internet connection (to an ISP or AOL specifically), although the AirPort can't be programmed to fail over to a dialed connection if the WAN connection fails. There's also a USB port on the AirPort for shared devices such as printers.

One strong upside to the AirPort Extreme is the ability to force clients into using a Remote Authentication Dial-In User Service (RADIUS) server. While not a full-blown 802.1X authentication framework, this added authentication step is welcome, and worked correctly with our lab's RADIUS server.

AirPort Extreme had good performance in our speed tests, but the range was slightly below average. An external antenna port is available, which might optionally increase range.

Conclusion

Prestandard 802.11g products are targeted largely at home and small-business use, and don't have the emphasis on access-point-based security features seen in products poised toward industrial and campus use. The 15M to 25M bit/sec data speeds offered by 802.11g in our tests is far faster than the 4M bit/sec speed of 802.11b. It is probably safe for early business adopters with their own mutual-authentication security infrastructure to start dabbling in 802.11g — the speed gains are immediate in homogeneous 802.11g networks.

Those with mixtures of 802.11b and 802.11g will find that access points uniformly slow to accommodate the slower speeds of 802.11b, but still will get benefits. This includes the ability to service areas with a higher concentration of users to a single access point, as the 802.11g MAC layer is still Ethernet, which likes quick and tidy transactions.

While 802.11b won't go away for a while, many companies might feel that the superior speed potential of 802.11g and its backward-compatibility with 802.11b warrants dropping 802.11b in favor of 802.11g (or even 802.11a or the hybrid 802.11a/b/g equipment). Perhaps, in a year, this will be true, once the standards have finalized.

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How we did it

We tested the products at a close proximity (9 feet) and far proximity (65 feet) for speed rates, the ability to associate and log on 802.11b clients, the ability to associate and log on 802.11g clients (PC cards only) from each of the six vendors in the test. We also noted the vendors' card ability to fall back in speed in a linear way at four test points (32 feet, 65 feet, 98 feet and 147 feet away from the access point). The fallback test is referred to as the walkabout test.

Maximum throughput measurements were taken at the 802.11g client with an FTP application. The FTP server (a Compaq DL580 running SuSE Linux 8.1) delivered the test file via FTP to the clients from cache. An average of four downloads were taken to determine the test result figure. Maximum throughput tests for all access points were tested in strict 802.11g mode where available, or in best or 54M bit/sec modes where available.

Seven network cards were used on each throughput test. An average of four downloads were made and then averaged among the cards. Cards used were the Netgear WAG511, SMC Networks 2835W, D-Link Systems DWLG650, Buffalo Technology WLI CB-G54, Belkin F5D7010, Linksys WPC54G and an internal Apple PowerBook G5 AirPort Extreme card. The tests represent a "very best case" scenario — none of the cards that the vendors sent had Microsoft digitally signed device drivers and were current as of April 7. Access point firmware was updated from the vendors' Web sites and were current as of April 7.

One client was a Compaq Presario 700s (900MHz Athlon, CardBus, no other applications, including virus protection, were loaded with Windows XP Professional with Service Pack 1. The other client was an Apple PowerBook G4 with the internal AirPort Extreme wireless feature.

The 'Frankenstein' spec

Some call 802.11g the "Frankenstein" specification because of the competitive number of supported communications relationships it supports — and the desire to have 802.11g components optionally backward compatible with 802.11b. There's the problem — the multiple modes that need to be supported in 802.11b-compatibility mode demands a sophisticated access point architecture in a prestandard environment.

The 802.11g products use the same channels as 802.11b but gain their speed by using radio modulation schemes similar to those in 802.11a. The difference in modulation schemes is similar to advances in the early 1990s when modem speeds increased because of advances in modulation schemes.

Like 802.11b, there are three nonoverlapping channels of 11 total available in the U.S. (with more or less available worldwide). The number of overlapping channels is important because access point placement demands the ability to prevent two access points from affecting each other to prevent co-channel interference.

There are two modes for 802.11g — compatible with 802.11b, or strict 802.11g mode. In the compatibility mode, an 802.11g access point has to fall back to 802.11b speed if there are any 802.11b components in the local "air space."

802.11g products are not compatible with 802.11a products because they use different operational radio frequencies — 2.4GHz for 802.11b and 802.11g, and 5GHz for 802.11g. Companies have come out with client cards (called 802.11a/b/g or 802.11a/g) that cover 802.11b and g, and optionally, but not yet concurrently, 802.11a. Cards do not concurrently access two different access points because routing and security problems might occur. This card is targeted at users desiring to use any of the three wireless LAN standards at will. In our tests, we used one trimode card, the Netgear WAG511.

— Tom Henderson

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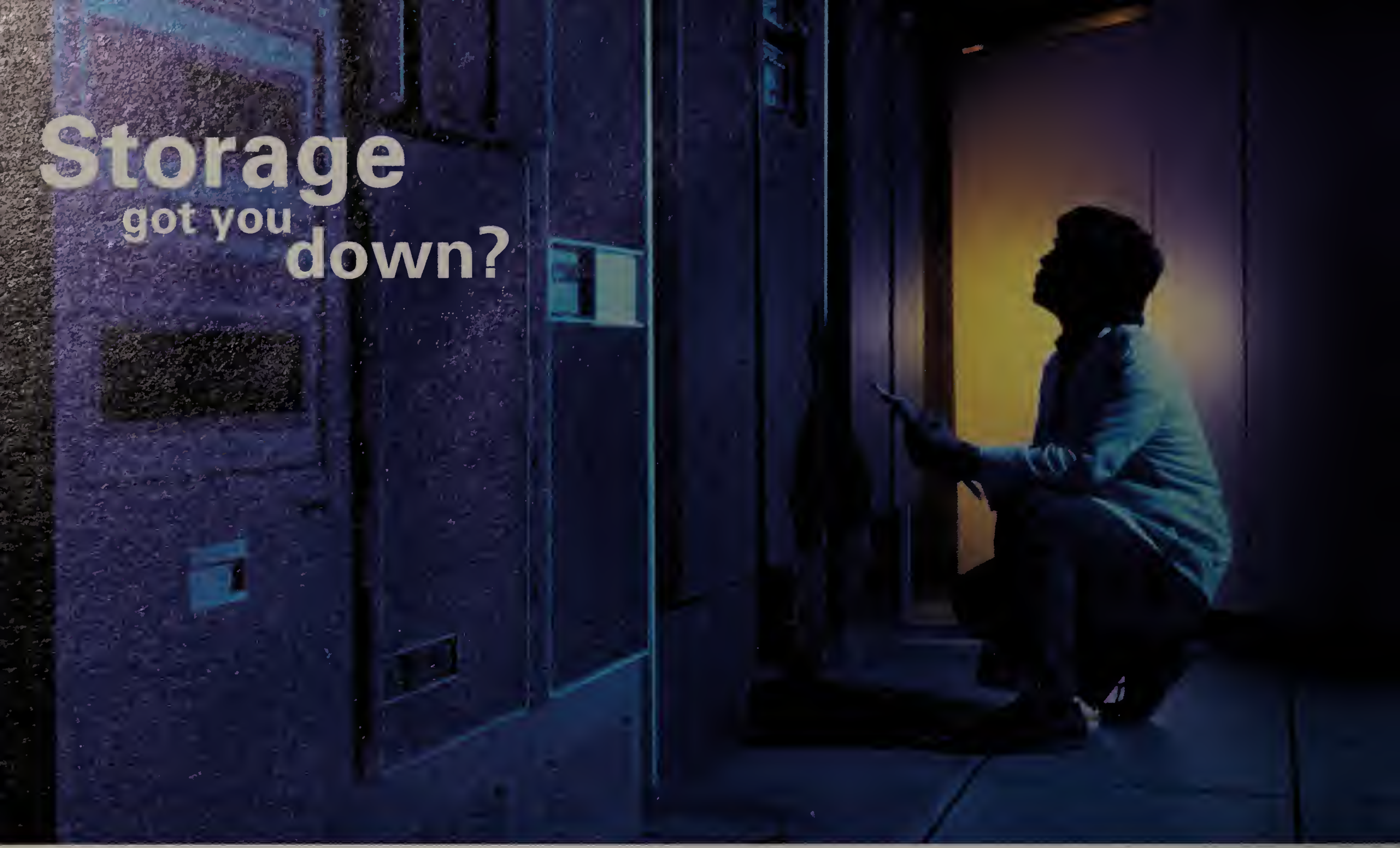

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NetworkWorld Review

Apple Xserve

Apple's new Xserve is fast and well equipped for network use

■ BY TOM HENDERSON, NETWORK WORLD GLOBAL TEST ALLIANCE

What doesn't come from Advanced Micro Devices, Intel or Sun; is based on open source practices; provides comparatively fast services for Windows, Mac, Linux and BSD clients; holds up to 720G bytes of stored disk data; and is just 1.75 inches tall? It's Apple's Xserve 1U server platform — now in its second iteration.

Xserve is based on the PowerPC CPU running at a minimum of 1.3 GHz with up to two of these CPUs fitting into the 1U Xserve form factor. Instead of one disk channel, there are three ATA-133 channels and up to 720G bytes of disk in the server.

Apple's operating system on this platform — OS X Server 10.2.5 — is built on the Darwin Branch of BSD, and is covered under the Apple Public Source License, which varies from the Open Source license that underlies Linux. The BSD heritage of Darwin means that users familiar with Unix, Linux and especially xBSD will feel at home, although there are many Darwin-specific GUI-driven applications that control traditional command-line administration applications.

Xserve is not a plain vanilla server that tries to compete on price/performance. Its extra features (such as independent disk channels, FireWire 800 and high-tech-touch hard drive bays) carry a high price tag. To its benefit, it has no user-license fee, connects a variety of operating-system client types, and delivers strong Web performance.

Performance

We subjected Xserve's Apache Web server to the same suite of tests using Spirent Communications' WebAvalanche software that we used to stress Windows 2003 Enterprise Edition with Microsoft's Internet Information Server (see Windows Server 2003 review at www.nwfusion.com, DocFinder 5821) and found performance was quite strong (see graphic, page 50).

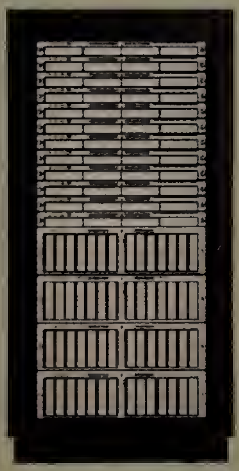
The ATA-133 disk interfaces and drives in Xserve were comparatively fast in our testing, although internal RAID configurations seemed to take up excessive CPU time. A RAID Level 1 configuration slowed disk writes by as much as 5%, with 3% being typical. We also connected our Lexmark printer as an Unix Line Printer device and printed through Xserve with Apple, Linux/BSD or Windows clients with ease. (See How we did it, DocFinder: 5830).

Net Results

Apple Xserve with OS/X 10.2.5 operating system

3.75
RATING

Company: Apple, (800) 692-7753, www.apple.com **Cost:** $3,800 configured with two, 1.33-GHz CPUs; 512M bytes of memory; and a 60G byte ATA-133 hard drive. **Pros:** Strong performance; open source appeal. **Cons:** Expensive; few enterprise security features.



What's the score?	Xserve 1U server
Installation/integration 25%	4
Performance 25%	4
Management 25%	4
Security 25%	3
TOTAL SCORE	3.75

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

Setup

Xserve comes with a front bezel that is removed for rack installation, which can be done via a supporting frame, as we used, or a midchassis/double-rail installation. Xserve contains quite a bit of densely packed hardware, and therefore generates a lot of heat, and associated fan noise can be high.

There are two methods of initially activating Xserve's software — via an Apple client networked to it ("headless") or by outfitting the Xserve with monitor, keyboard and mouse. There is no HTTP interface for installation, so an Apple running OS X Server 10.2 or a USB keyboard/mouse and monitor is required. Secure Shell can be used for command-line-based applications but not for installation purposes.

The unlimited user license ships with Xserve at no additional charge. Xserve uses common Unix-derivative applications such as Samba and Common Unix Printing System, and these applications are controlled by Xserve server administration applications.

Several choices for file/print compatibility are offered at installation time. We were dismayed to find that upon initial installation more than 90M bytes in upgrades were required. We would have preferred that Apple ships a fresh system with all current updates. This leads to a possibly long download, installation and reboot time to make the server usable.

We tested the product's Windows user management capabilities, which come via Samba. Apple's version of Samba can be administered via Xserve's graphical user interface. The System Manager application lets Xserve become the equivalent of a Windows primary domain controller or master controller.

At the core

Xserve supports up to 720G bytes per server in four drive bays, and each bay is connected to a separate ATA-133 disk channel, instead of the drives sharing a single channel. Although there are few internal RAID options, Apple markets an Xserve RAID subsystem that's connected to Xserve via an optional independent Fibre Channel controller.

Xserve uses the Hierarchical File System (HFS), which provides backward compatibility with Mac OS/9 and earlier clients. With the introduction of OS X Server 10.2.2, Apple offers the option of a journaled file system. I/O transactions in such systems are highly detailed, so it is easy to recover from a system halt.

Journaling isn't turned on by default with Xserve. It adds nominal disk overhead, but does seem to have an effect on throughput, increasing disk write times considerably. We launched a script that wrote a 100M- byte file concurrently from six workstations before and after HFS journaling was activated. Journaled file-system execution time increased from 42 seconds (nonjournaled) to 61 seconds (journaled).

Apple uses a 66-MHz/64-bit PCI bus in this platform. Xserve comes with three bus slots. A Gigabit Ethernet port that's in addition to the Gigabit Ethernet port on the motherboard takes up one of the bus slots.

Also included are IEEE 1394/FireWire 800 connections. While FireWire — a serial device interface bus running at near-gigabit speeds — isn't used much in the Windows world, it's often used in Macintosh and Sony computers, as well as for video devices, portable disk drives, and occasionally as a network transport. Keyboard and mouse connections to Xserve are strictly via USB (1.1).

A graphical System Monitor application tracks internal configuration of one or many Xserves in a network. Alarm conditions are noted, and even things such as fan speed and system temperature are recorded.

Server security

Apple supports an IP firewall. The firewall lets you select which part of the NetInfo directory service domain is visible, and lets you block User Datagram Protocol in port ranges. Apple offers stateful packet inspection but not advanced firewall features.

Apple bundles three applications: NetMinder Ethernet, which captures, decodes, and provides rudimentary analysis on network I/O; LAN Surveyor, which is a network mapping/GUI-based asset management package; and CyberGauge, an SNMP monitoring package that's limited to Xserve in the limited bundled edition.

NetInfo directory services

OS X Server uses NetInfo to consolidate and distribute directory services information. In Apple's model, each machine has its own NetInfo directory database, which can be forward-referenced to a higher level, such as a server. Apple purchased PADL Pty., and its Lightweight Directory Access Protocol-NetInfo bridge to provide a link between NetInfo and LDAP services.

We set up a NetInfo domain, then established one server as a root domain, while the other three servers supported subsidiary domains. During this process, we also established the root server as a Windows primary domain controller (PDC). We discovered that the PDC control, done in conjunction with Samba, needed to be installed on a quiet network, with all Windows 2000+ clients turned off, as Win 2000 clients and a Win 2000 Server would try to force an election of themselves as a master domain controller. We later found a registry hive for Win 2000 and XP that prevent them from asserting control over the PDC services in Xserve. Synchronizing the domains, essentially grafting domains together, was simple.

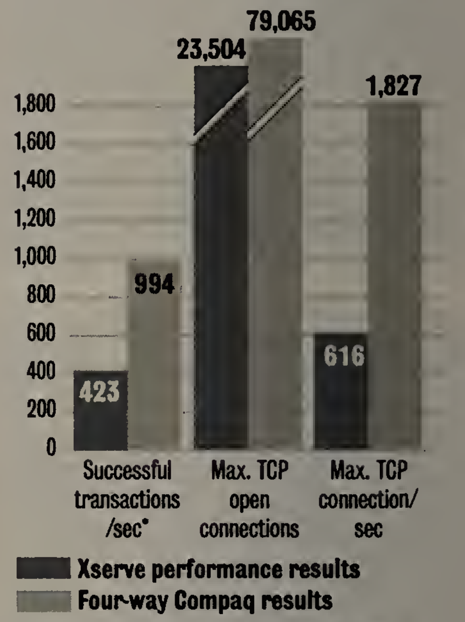
Overall

Xserve hosts many services, from file-and-print for a variety of client types. While decidedly Apple, Xserve puts to shame many of the Linux distributions available by tying together the diverse number of applications that are needed to administer an equivalent Linux server into a simple, GUI-driven interface. Xserve plays well in a Windows network, but also accommodates a variety of network constructions — all from a tight 1U package.

Henderson is managing director of ExtremeLabs of Indianapolis. He can be reached at thenderson@extremelabs.com. He is a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/ alliance.

Counting Xserve Web performance

Apple's Xserve 1U server running OS X Server 10.2.5 and Apache racked up some respectable numbers against the Windows 2003 Advanced Server in our Web performance benchmarks. Note that the Xserve platform has only two 1.3-GHz CPUs compared with the four-way 1.8-GHz CPU Compaq server hosting Windows 2003 and DIS.



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Under pressure

Challenged with delivering competitive infrastructures at little cost, CIOs outline their top concerns.

■ **BY LINDA LEUNG**

Andy Crowder, CIO of Central Florida Investments, says he is in a better position than his peers to ride out the depressed economy. He's always had to justify his investments to his company president, which has let Crowder keep a tight lid on IT spending.

The Orlando company is a holding entity for Westgate Resorts, which manages 1,200 U.S. time-share properties. CFI has boosted its number of time-share properties by 30% to 40% in the past two years, and it increased its IT staff by 17% in 2002 to the current roster of 123 employees.

Crowder is taking advantage of the downturn and gets more for his bucks, while many of his peers are having their purses snapped shut. "The down economy allows us to acquire technolog at lower cost," he says.

Just as Crowder has had to justify investments, his peers at other firms are now under increased pressure to do the same, according to the findings of Gartner Executive Programs' (EXP) 2003 CIO Agenda.

The 620 CIOs who participated in the annual survey say IT budgets are flat. CIOs must manage the concurrent business demands of lower cost, higher levels of security and better risk management. The upshot? CIOs must innovate their existing infrastructures to accomplish these goals.

Organizations can't afford to sit back and wait for economic recovery — CIOs must deliver IT infrastructures that are secure and let their organizations remain competitive with little additional investment.

"CIOs are taking a hard look at maintenance contracts and the value of external system integrators, and are having to cut some projects that are not producing ROI," says Ellen Kitzis, group vice president at Gartner EXP.

Some of this is being played out at the University of North Carolina Health Care System in Chapel Hill.

J.P. Kichak, vice president and CIO of the healthcare facility, says his IT budget will be flat for UNC's fiscal year 2004. For fiscal 2003, his budget fell 18% compared with a 13% increase for fiscal 2002.

Money that is earmarked for buying new assets is being reduced by $2 million to $3 million for fiscal 2004. IT usually juggles between 30 and 40 IT projects each year, but some will be cut, Kichak says.

UNC will continue with IT projects that help it become more efficient, capture lost revenue, consolidate systems and cut costs. Those initiatives include a call distribution system of accounts receivable and its flagship Clinical Information System (CIS) project with IBM. But the implementation times of some projects have been pushed back.

"It makes our job more difficult if we have to stretch implementation time, which delays ROI," Kichak says. "Also, it makes it difficult to restart projects when the economic situation improves — it's difficult to get people motivated to work on the project again."

One project that has had its implementation time stretched by four months is the delivery of Version 3 of CIS, a Web-based infrastructure that lets remote clinicians access patient medical records from any browser through a secure Internet connection or via an intranet for on-campus staffers. UNC has operated CIS in a thin-client architecture for four years, and the organization saves between $350,000 and $400,000 per year in software licenses and staff time compared with managing its previous fat-client architecture.

In addition to worries about funding new projects, Gartner says many CIOs are concerned about the cost of ongoing maintenance to recently installed applications. These need to be paid from this year's flat budgets, which suggests that there'll be no money left for new initiatives.

Kichak echoes that sentiment. "I'm concerned that if the budget continues to be flat for the longer term, our infrastructure will get out of date, and we will be playing catch-up. I'm concerned that there is not enough funds to continue with adding new functionality to the infrastructure as well as to maintain it," he says. He aims to avoid this by upgrading the part of the infrastructure that will be affected by the new services and applications, as those are added.

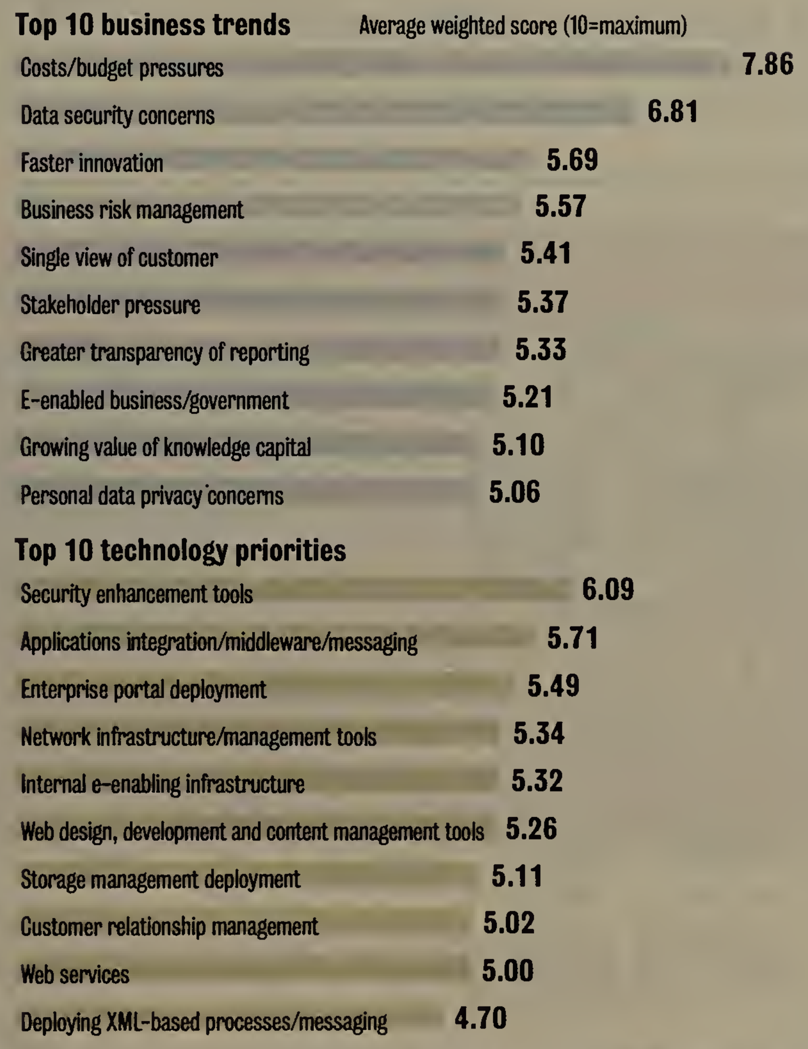
In terms of the CIO's own role in the organization, the executives Gartner polled say that providing guidance and coaching to board directors is now a top priority. Whereas providing guidance for the board and demonstrating business value of IT were ranked Nos. 2 and 3, respectively, by CIOs in 2002, these are the top two priorities for IT executives this year. "Effective CIOs are investing time and energy into ensuring that top-level decision-making involves business colleagues at all levels," the report says.

CFI's Crowder says his priority is to ensure that his IT workforce keeps focused on the end goal of the business and not just the task at hand. The basis of that, he says, is frequent communications with the business people and to ensure that they are involved with the IT projects. This is particularly important, as Crowder's team has to understand the business as part of its current project to build an ERP infrastructure from scratch — which it embarked on 16 months ago — as there is no such application specifically for the time-share property market.

The report also suggests that the average length of time a CIO retains his position in an organization has increased from 18 months three years ago to 36 months this year. "Some CIOs were measured on the success of one project or on fixing ERP projects that may have failed because of external business issues," Gartner's Kitzis says. "Now businesses recognize that time is needed to learn the success of the project and the importance of building stability [of staffing] in the organization." ■

Enterprise IT agenda

Gartner EXP's 2003 CIO Agenda survey shows that CIOs need to reduce costs and boost security.



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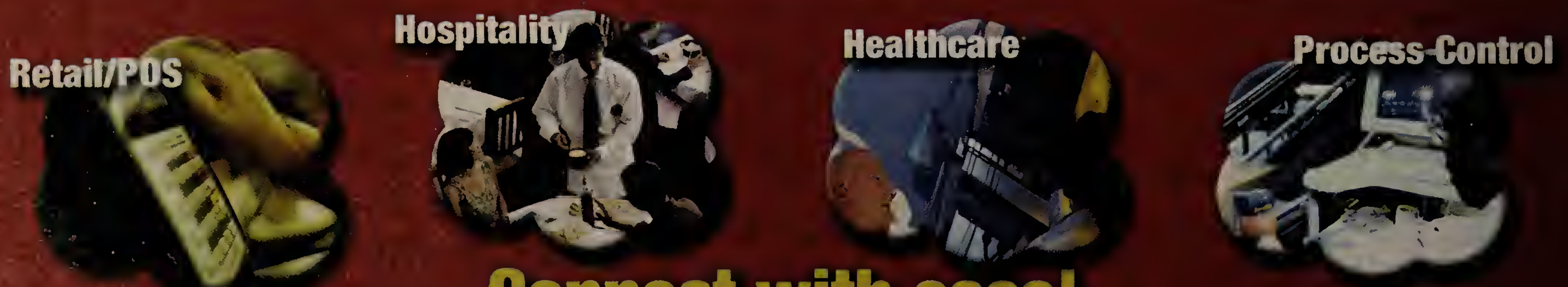

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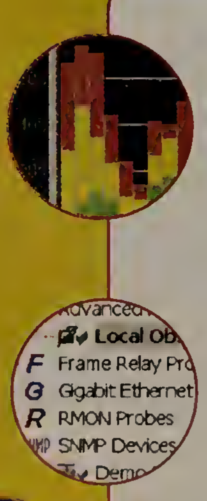

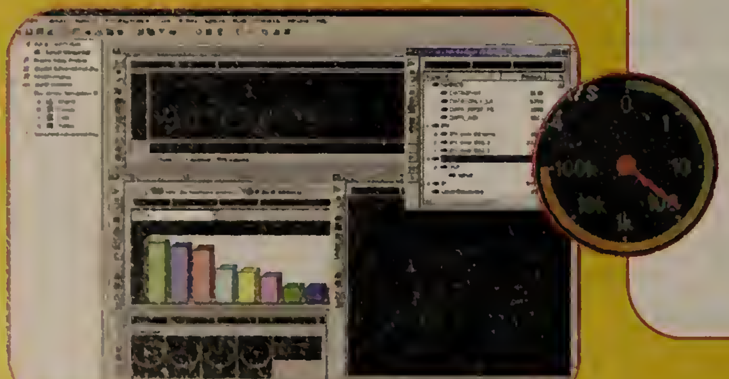

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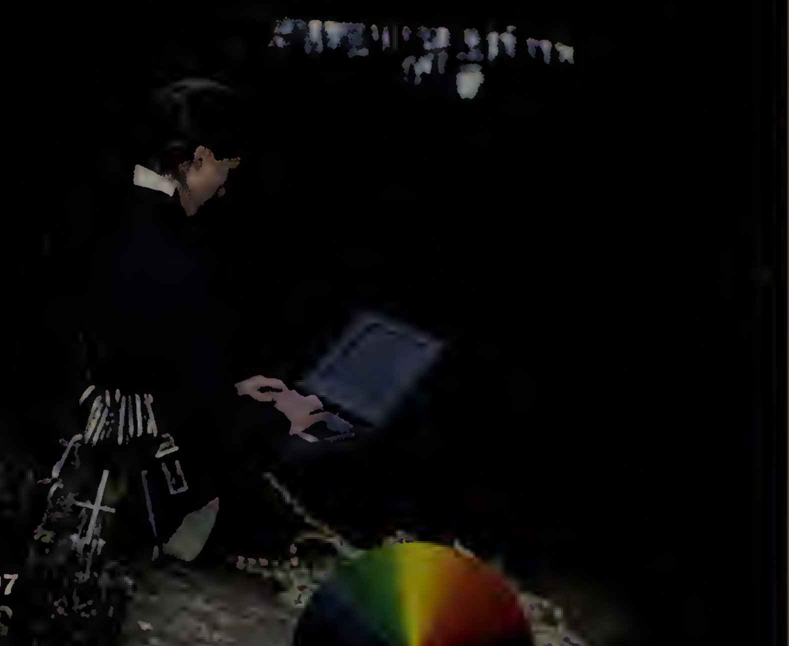

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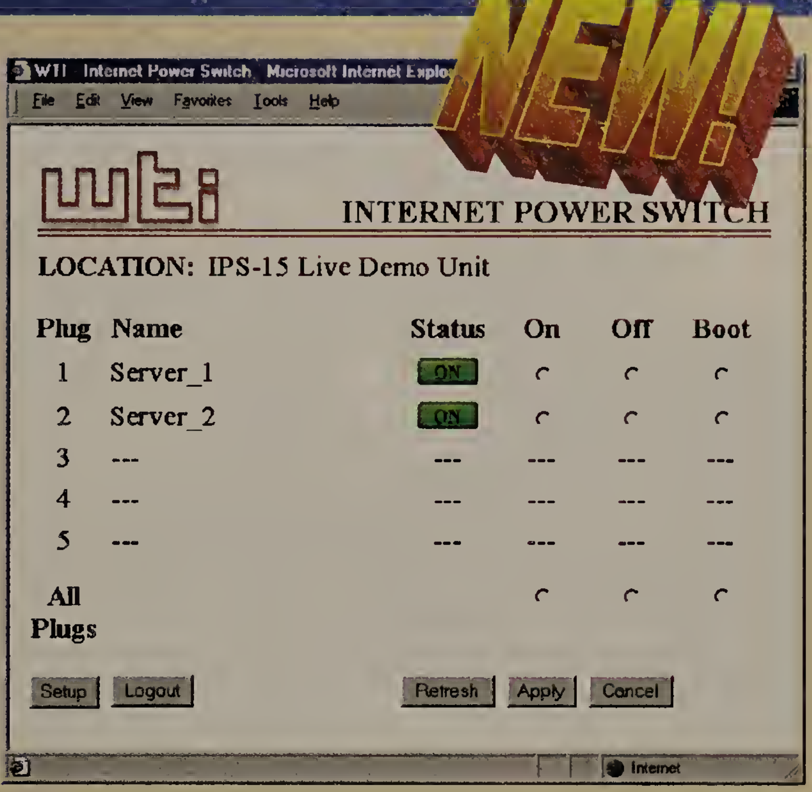
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3	---	---	---	---	---
4	---	---	---	---	---
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All Plugs			○	○	○

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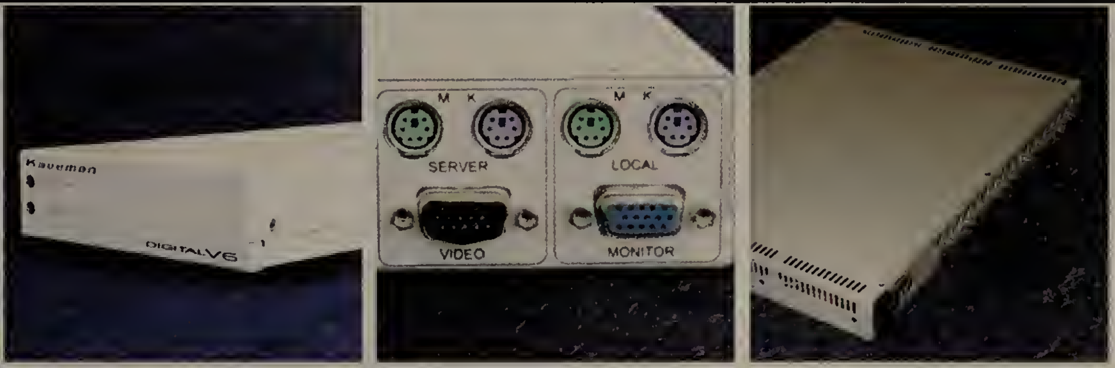

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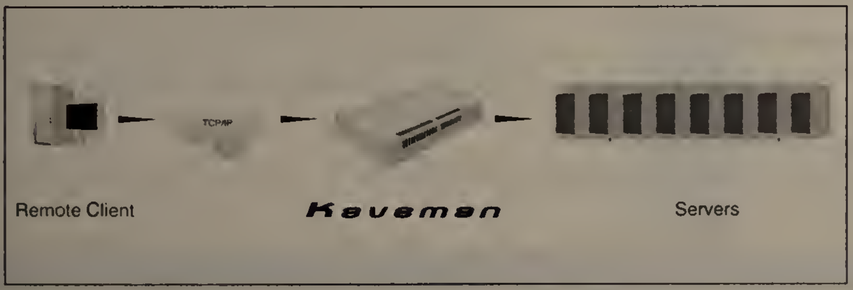

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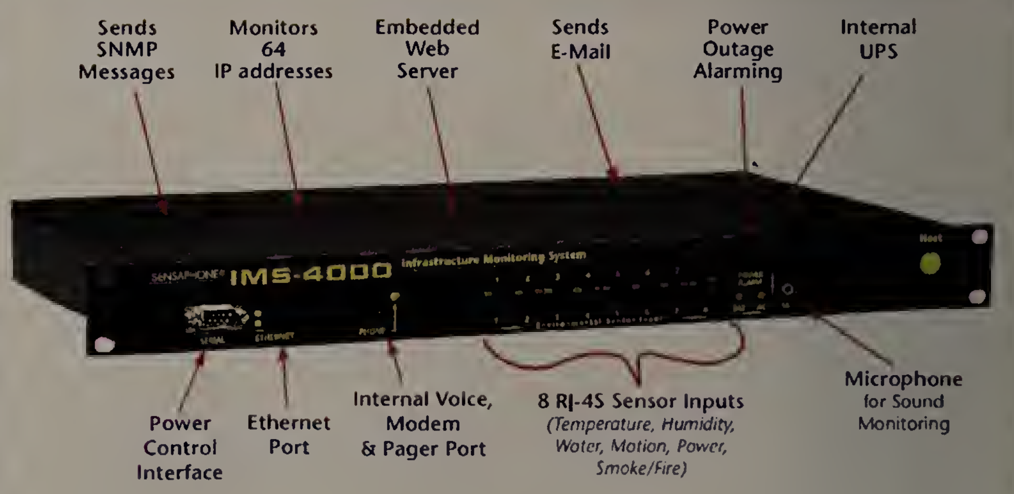

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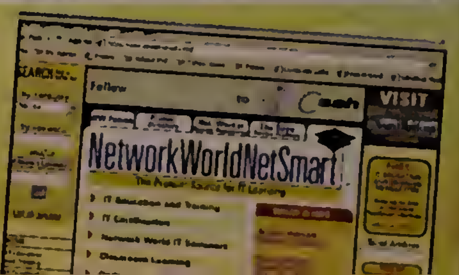

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Wi-Fi

continued from page 1

ways looks like the early days of the first Web browser, Mosaic, said Airespace CEO Brett Galloway, who earlier in his career served as director of engineering for wireless pioneer Metricom. People are getting their hands on Wi-Fi, finding it easy to use, and building applications for it that are attracting more devices, he said.

"You put that kind of market-adoption cycle together with the enormous untapped power of Wi-Fi . . . at some point, it's an unstoppable force," he said.

But all five agreed that unstoppable force is being restrained by the current architecture of Wi-Fi: individual access points connecting wirelessly to client devices and by cable to wiring closet switches.

"Think about access points," said Robert Machlin, CEO of AirFlow Networks and a veteran of network companies such as Ascend and Cascade. "They were built for [public-access] hot spots and the small office/home office market. But if you want to go to an enterprise deployment, where you use more than one access point, then how are you going to tie these together from a management viewpoint? What we're saying around this table is there's a systems approach to this problem."

That approach features a box, with Layer 2 and sometimes Layer 3 switching features, that plugs smoothly into existing wired networks. But it also has a wealth of added software to identify, track, secure and manage users logging in through a Wi-Fi radio connection. All five companies offer this basic solution, although one of them, Vivato, uses phased-array antennas to form and direct Wi-Fi beams at specific client devices.

MARK HARMEL

Vivato's Ken Biba stressed the importance of cost over technology when it comes to wireless LAN rollouts.

Although conceptually simple, these boxes will lead to some big changes in enterprise networks, the CEOs agreed. "We call it 'wireless LAN switching' mostly because it is an add-on to the existing LANs, at some level," says Keerti Melkote, co-founder of Aruba Wireless Networks.

"But we're radically changing what a LAN switch is, by radically changing what a wired LAN switch understands as a user," he said.

■ In next week's Technology Insider, we delve into the world of wireless LAN switches with a story that analyzes products from 10 vendors. There's also an ROI calculator to help you figure out the costs and the benefits of a WLAN rollout.

In traditional networks, switches don't need to know who a user is, because the cable that connects the switch to a PC anchored on a desk, and uniquely identified with a media access control or IP address, assumes that the PC user is the correct user.

"With wireless, you need to know who that guy really is before you let him onto the network," said Melkote, a one-time member of Intel's IT staff. "And that fundamental departure leads to a lot of different capabilities that you need to integrate into the switch."

"A good term for that is a 'user-aware network' instead of a 'device-aware network,'" Machlin said. "Take [established equipment makers such as] Extreme, Foundry and Cisco, do they just add support for wireless users [to their boxes]? And is that good enough?"

"If you look at a traditional wired switch, it actually doesn't do very much," Airespace's Galloway said. "The curious thing about wireless is that it's mobile. There are huge security issues as a result. You have to create a whole security framework that's a lot harder to do than what you have in an Ethernet switch. And you have the wireless [radio] medium itself, which doesn't operate by itself [as Ethernet does]."

The Vivato difference

Vivato CEO Ken Biba argued that these comments stressed technology too much over the "value proposition" to enterprise users. "The core argument is what does it cost?" he said. "What does it cost to deploy? What is the cost of Wi-Fi coverage? What is the cost of a megabit per square meter? Those finances ultimately drive the success of Wi-Fi."

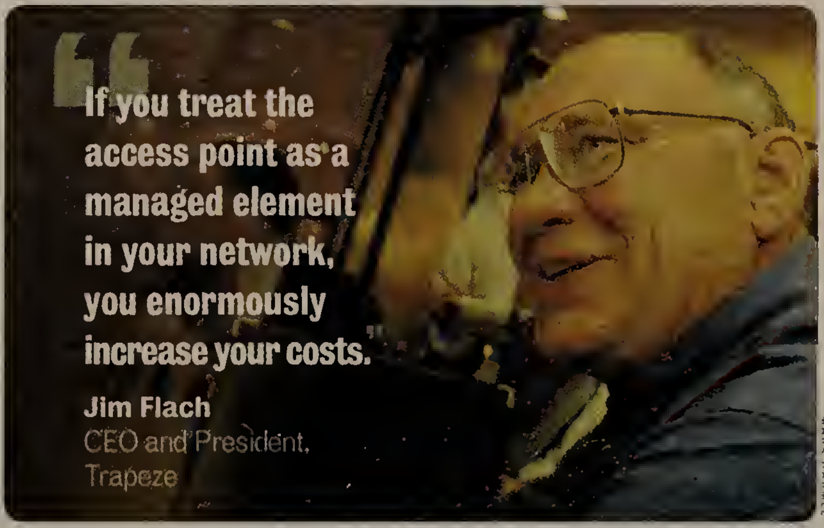
Biba cited the example of a well-known Wall Street brokerage firm, with whose network executives he had spoken recently. "We had a wonderful discussion about wireless LAN security, and we said to them, 'Golly, your guys are ready to deploy. What's your deployment plan?' And they said, 'Oh, we don't have any money to do that,'" he said.

Not surprisingly, Biba said Vivato's phased-array technology, in a one-yard-wide panel that combines access point and switch, cuts deployment costs dramatically because customers don't need to design, build and run WLANs consisting of scores of separate access points. But his rivals countered that they can exploit the same hardware trends that have made computers relatively inexpensive.

Trapeze CEO Jim Flach insisted that wireless switches can handle a whole range of wireless LAN problems, whether or not they make use of special antennas.

"Our approach is to leverage the commoditization that's already happening around the access point," Aruba's Melkote said. "There's a bunch of vendors already doing radio chipsets. They cost a hundred bucks today. That same chipset is going to cost 10 bucks soon. Whether it's deploying five of those, or 10 or 20, no one will care [because they're so inexpensive]."

Vendors and users face a trio of variables in WLAN calculations, Galloway suggested. "You have a triangle: cost, [radio] coverage and [network] capacity," he said. "And how you optimize those depends on circumstances. If you have an environment that's very obstructed for radio waves, then using a pico-cellular architecture [of numerous access points] can be very cost-effective. In other environments, it's going to make sense to create a coverage and capacity model that is more around managing the radio frequency beams."


"If you treat the access point as a managed element in your network, you enormously increase your costs."

Jim Flach
CEO and President,
Trapeze

MARK HARMEL

Taking on incumbents

All the CEOs said the network heavyweights don't have the solutions corporations need. "The traditional switch makers, like Extreme, don't even know how to spell 'RF,'" Machlin said.

Flach derided Cisco's approach of moving its IOS systems software into its line of Aironet access points. "If you treat the access point as a managed element in your network, you enormously increase your costs," said Flach, a former venture capitalist who has served as CEO or chairman of roughly a dozen network companies. By contrast, he said, Trapeze treats the access point as a stripped-down component, little more than a radio, that the switch can monitor and configure.

Cisco was clearly on the minds of all the participants, which between them have raised $74.5 million in venture funding. Melkote said two of the most common questions asked by investors and others are: "Why can't Cisco just put this wireless LAN switch technology in a switch blade?" And "When is Cisco going to buy you?"

All five agreed that putting voice traffic over WLANs was sparking keen interest among their corporate prospects, although few were actually doing so at present. Melkote said that small branch offices are proliferating, with attendant high costs to provision them. Voice converged with data over a common wireless IP LAN could make such provisioning less expensive, he said.

Galloway said the WLAN is actually the "killer application" for voice over IP (VoIP). "One of the things that's been missing for VoIP is a driver for you to put in lots of additional ports, and buy lots of additional handsets," he said. "If you're just doing incremental additions, you're going to stick with the current architecture of PBXs and so on." But with wireless LANs, VoIP suddenly makes sense, he insisted.

Even though N+I was much smaller than usual, it did nothing to dampen the enthusiasm of the executives.

"This is the only area of networking with life," AirFlow's Machlin said. ■

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BackSpin Mark Gibbs

Sun's answer to the upgrade shuffle

Before we get to the meat of the matter (and I'm not making this up): According to the Associated Press, Microsoft's MSN division in the U.K. is developing a portable toilet with a wireless keyboard and an extending, height-adjustable plasma screen in front of the seat.

The company plans to have a Hotmail station on the outside with a waterproof keyboard and a plasma screen for those waiting in line. As if that wasn't enough, the company also intends to have toilet paper printed with Web site addresses.

Surprisingly, this isn't the first time that high-tech companies have toyed with the toilet. Back in 2001 the U.S. Patent and Trademark Office awarded a patent to IBM for "an apparatus, system and method for providing reservations for restroom use" — in other words, a queuing system for water closets. IBM recently decided to abandon the patent.

Sun, as far as I can determine, has never attempted to conquer the high-tech restroom market. The company has grander things on its mind, one being Project Orion, a strategy to simplify the acquisition, deployment and management of enterprise infrastructure software.

Like every other infrastructure player, Sun historically has distributed releases, updates, patches and new versions of its many flavors of software whenever they happened to bubble up.

Because Sun has scores of software products — everything from directory servers to identity servers to portal servers — the flow of updates is more like a continuous stream. And for large shops using Sun technology, the hassle of trying to deal with changes for a range of products that appear all over the calendar is enormous.

And sometimes the updates aren't compatible — for example, a new release of Java could break your Java Server Pages environment until a JSP patch came out. This makes it crucial to test everything.

Enter Sun's Orion, which was first previewed in February. The basic idea is to bring order to the integration, testing and release of infrastructure software. With Orion, Sun will provide software updates "on a quarterly release train that will become a single product called Solaris," says Jonathan Schwartz, Sun executive vice president of software.

Let me note that bizarre descriptions such as "quarterly release train" are becoming too common in the IT industry. I blame the venture capitalists who are always mangling the English language.

Orion will encompass: Solaris, Solaris for x86 and Linux, along with a common Java runtime environment; a Web services infrastructure (application servers and portals); Microsoft-interoperable e-mail and communications; Liberty-enabled directory and identity; grid engine, streaming media, storage management, availability monitoring technologies and clustering.

By grouping all updates, the implication is that they will work together. And releasing them together on a schedule means it should be possible to reduce planning and testing costs. This should make managing enterprise implementations simpler and cheaper.

Sun has yet to detail Orion pricing, but there has been talk of a range of licensing plans, including yearly subscription, pricing per CPU or pricing per user seat. There's also been some wild talk of metered billing. A nice idea, but I would suggest that is too technically complex to appear soon.

Sun says Orion has the potential to change the enterprise software industry by making infrastructure-software delivery predictable, easier to evaluate and more affordable.

Orion is, in principle, a huge strategic step for Sun, creating a more streamlined enterprise-management environment with simpler licensing — definitely a compelling story for customers and a good response to the competition. If the company could just come up with a plan for the high-tech toilet market ... a Java powered latrine. Now there's a story.

Relieve yourself to backspin@gibbs.com.

'NetBuzz News, insights, opinions and oddities

By Paul McNamara

Bet on the Internet winning this one

Despite possessing a libertarian streak that's widening over time, Buzz doesn't get all knee-jerky in opposing new government regulation, even when politicians start messing with the Internet.

No, it's only the asinine kind of government regulation that gets me spittin' bits.

Take last week's news that a subcommittee within the House Judiciary Committee approved on a voice vote — the kind lawmakers use when they don't want to be held accountable — a bill that would attack offshore Internet gambling in two ways. The first would force ISPs to delete links to gambling sites — a proposition that needs to be called what it is: government censorship and virtually impossible to enforce. The second prong would compel credit card companies and online payment systems such as PayPal to rat out customers they suspect might be paying gambling tabs — a proposition that ought to have online privacy advocates storming the halls of Congress.

Let's be clear for those who haven't experienced me ranting about this before: All forms of gambling should be legal, regulated and taxed. Free-market forces and legitimate zoning concerns should dictate the number of gambling establishments in the physical world, not misplaced paternalistic instincts and the power of governments to shield monopolistic state lotteries and Indian-run casinos from competition. In cyberspace, only the free market is needed.

Please spare me your entreaties about compulsive gamblers. I'm related to one (he's doing fine now, thank you). Just as with alcoholics and butt fiends, we should get these unfortunate people help, and make the industry that profits from their misery foot the bill. (I never claimed to be a strict libertarian.)

Repeat after me: Prohibition just doesn't work, never has worked and never will. But this won't stop prohibitionist politicians from trying.

"The very characteristics that make the Internet such a valuable resource are also the reasons why it has such a huge potential to impinge on the stability of the American family, American financial institutions and our national security," Rep. Jim Leach (R-Iowa) said earlier this year in touting his bill.

What a bunch of red, white and blue horse-pucky. As with so many politicians, Leach hasn't absorbed the first thing about what makes the Internet a valuable resource. As for the idea that American families are strengthened by lawmakers dictating to them how they can and cannot spend their disposable income, someone will need to explain to me how that qualifies as "conservative" thinking from a leading Republican. The nonsense about financial institutions and — give me a break — national security, ought to embarrass even a congressman practiced in the art of hyperbole.

The hypocrisy of this stuff is mind-numbing. (Which reminds me: What does William Bennett think about the virtues of Internet gambling?)

As we speak, there are 10 gambling boats licensed to operate in Rep. Leach's home state of Iowa, as well as three racetracks and three casinos. These businesses raked in about $1 billion last year, and, since Iowa isn't exactly an international tourist attraction, I'm going to presume most of that loot came from stable American families. Iowa also has a state lottery, of course, with 139 outlets just in Des Moines, a city of fewer than 200,000 inhabitants.

In other words, an Iowan cannot step outside of his or her home without stepping into a cornfield or a gambling establishment.

So why on earth should the government keep those same people from gambling in the privacy of their own Web browsers?

The columnist is headed off on vacation, which will include a day trip to his favorite casino. In the meantime, you can send e-mail about this tirade to buzz @nww.com.

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